Agriculture and Agri-Food Canada | Agriculture et Agroalimentaire Canada

An Overview of the Canadian Agriculture and Agri-Food System

2007

Canada

An Overview of the Canadian Agriculture and Agri-Food System

Project Manager
Kathleen Kittson

Project Team
Samuel Bonti-Ankomah, Margaret Zafiriou, Shuhua Gao, Nasreen Islam

This publication comprises data and analysis provided by all four divisions of the Research and Analysis Directorate as well as contributions from other Divisions and Branches of Agriculture and Agri-Food Canada particularly the Food Value Chain Bureau.

May 2007

Research and Analysis Directorate
Strategic Policy Branch
Agriculture and Agri-Food Canada

Note to Readers

This publication reflects the latest data available as of May 2007.
Due to rounding, totals may not add to the sum of their components.

IMPORTANT NOTICES

Copyright/Permission to Reproduce
Materials in this publication were produced and/or compiled by Agriculture and Agri-Food Canada for the purpose of providing Canadians with direct access to information about the programs and services offered by the Government of Canada.

The material in this publication is covered by the provisions of the Copyright Act, by Canadian laws, policies, regulations and international agreements. Such provisions serve to identify the information source and, in specific instances, to prohibit reproduction of materials without written permission.

Non-commercial Reproduction
Information in this publication has been provided with the intent that it be readily available for personal and public non-commercial use and may be reproduced, in part or in whole and by any means, without charge or further permission from Agriculture and Agri-Food Canada. We ask only that:

Users exercise due diligence in ensuring the accuracy of the materials reproduced; Agriculture and Agri-Food Canada be identified as the source department; and the reproduction is not represented as an official version of the materials reproduced, nor as having been made, in affiliation with or with the endorsement of Agriculture and Agri-Food Canada.

Commercial Reproduction
Reproduction of multiple copies of this publication, in whole or in part, for the purposes of commercial redistribution is prohibited except with written permission from the Government of Canada's copyright administrator, Public Works and Government Services Canada (PWGSC). Through the permission granting process, PWGSC helps ensure individuals/organizations wishing to reproduce Government of Canada materials for commercial purposes have access to the most accurate, up-to-date versions. To obtain permission to reproduce materials in this publication for commercial purposes, please consult with PWGSC.

Public Works and Government Services Canada
Publishing and Depository Services
350 Albert Street, 4th Floor
Ottawa, Ontario
Canada
K1A 0S5

Third-party Materials
Some of the materials and graphical elements found in this publication are subject to copyrights held by other organizations. This is particularly true of sites that are jointly operated by a Government of Canada institution and an external organization as part of a collaborative arrangement. In such cases, some restrictions on the reproduction of materials or graphical elements may apply and it may be necessary to seek permission from the rights holder prior to reproducing the material.

© Her Majesty the Queen in Right of Canada, 2007

Publication 07-033-RB
ISSN 1708-4164
ISBN 978-0-662-47429-6
Catalogue A38-1/1-2007E-PDF
Project 07-033-r

Electronic versions of Research and Analysis publications are available on the Internet at:
http://www.agr.gc.ca/pol/index_e.php

Aussi disponible en français sous le titre :
« Vue d'ensemble du système agricole et agroalimentaire canadien »

TABLE OF CONTENTS

Foreword ..... ***vii***

Highlights ..... ***ix***

Executive Summary ..... ***xi***

Section A ***Special Features*** ***1***
A1. Census of Agriculture Summary 3
A2. New Industrial Uses of Agricultural Products 19

Section B ***The Agriculture and Agri-Food System and the Canadian Economy*** ***29***
B1. GDP and Employment 31
B2. International Trade and Global Developments 37
B3. Competitiveness, Productivity Growth and Innovation 47

Section C ***Components of the Agriculture and Agri-Food System*** ***63***
C1. Consumers 65
C2. Food Distribution (Retail, Wholesale and Foodservice) 73
C3. Food, Beverage and Tobacco (FBT) Processing 81
C4. Primary Agriculture 89
C5. Agricultural Input and Service Suppliers 121

Section D ***Government and the Agriculture and Agri-Food Sector*** ***125***
D1. Government Expenditures in Canada 127
D2. Producer Support Estimates (PSE) and Agricultural Policies in Canada and Other Countries 133

Glossary ***137***
Acronyms 138
The System's Components 139
Non-Financial Industries 142
Farm Types 143
Trade Categories 144
Government Support Categories 145
Government Support Measures 146
Economic and Statistical Terminology 147

Data Sources and References ***151***

LIST OF CHARTS

Section A Special Features

A1 Census of Agriculture Summary

A1.1 Number and Size of Farms in Canada, 1941-2006 4
A1.2 Average Herd Size, 1971-2006 4
A1.3 Number and Size of Farms, 2006 5
A1.4 Number of Farms by Province, 2001 and 2006 6
A1.5 Gross Farm Revenues by Province, 2001 and 2006 6
A1.6 Number and Percent of Census Farms with Gross Farm Receipts of $250,000 and over, 1981-2006 7
A1.7 Number and Percent of Census Farms with Gross Farm Receipts of One Million Dollars and over, 1981-2006 7
A1.8 Share of Farms and Gross Farm Revenues by Farm Size, 1996 8
A1.9 Share of Farms and Gross Farm Revenues by Farm Size, 2006 8
A1.10 Number of Farms Using Computers for Business, 1986-2006 9
A1.11 Computer Application Use, 2001 and 2006 9
A1.12 Land Use, 1971-2006 10
A1.13 Land Use, 2006 10
A1.14 Soil Conservation Practices, 2001 and 2006 11
A1.15 Tillage Practices in Canada, 1991-2006 11
A1.16 Acreage Allocation to Various Crops, 1976-2006 12
A1.17 Acreage Allocation to Various Crops, 2006 12
A1.18 Acreage Allocation to Major Fruits, 2006 13
A1.19 Acreage Allocation to Major Field Vegetables, 2006 13
A1.20 Greenhouse Area in Canada, 2001 and 2006 14
A1.21 Greenhouse Area by Province, 2001 and 2006 14
A1.22 Farms Reporting Organic Products by Type of Crop, 2006 15
A1.23 Number of Farms with Organic Production by Province, 2006 15
A1.24 Land Tenure, Canada, 1968-2006 16
A1.25 Land Tenure as Percent of Total Land by Province, 2006 16
A1.26 Age Class Distribution by Revenue Class, 2006 17
A1.27 Average Age of Operators by Farm Type, 2006 17

A2 New Industrial Uses of Agricultural Products

A2.1 Overview of the Bioeconomy and Bioresources 20
A2.2 Global Demand for Bioproducts, 2003 20
A2.3 Biomass Availability 21
A2.4 Drivers of the Biofuels 21
A2.5 World Primary Energy Consumption, 1980-2004 22

A2.6 U.S. Annual Average Domestic Crude Oil Prices, 1949-2006 22
A2.7 Cost of Production Ranges for Ethanol and Gasoline, 2006 23
A2.8 Biofuel Yields of Selected Ethanol and Biodiesel Feedstocks, 2006 23
A2.9 World Ethanol Production, 1975-2005 24
A2.10 U.S. Corn Price, Sept. 2003 - May 2007 24
A2.11 Bioproduct Firms by Size, 2003 25
A2.12 Bioproduct Firms by Province, 2003 25
A2.13 Export Revenues of Bioproduct Firms, 2003 25
A2.14 Number of Products by Bioproduct Category, 2003 26
A2.15 Functional Food and Nutraceutical Firms in Canada, 2004 26
A2.16 R&D Spending by Bioproduct Firms, by Province 27
A2.17 External Contracting by Bioproduct Firms, 2003 27
A2.18 Impediments to Development, 2003 28
A2.19 Sources of Capital for Bioproduct Firms, 2003 28
A2.20 Importance of Health Claims for FFN Firms, 2004 28

Section B The Agriculture and Agri-Food System and the Canadian Economy

B1 GDP and Employment

B1.1 The Agriculture and Agri-Food System's Contribution to GDP and Employment, 2005 32
B1.2 The Agriculture and Agri-Food System's Contribution to GDP, 1991-2005 32
B1.3 The Agriculture and Agri-Food Sector's Contribution to Provincial GDP, 2005 33
B1.4 The Provincial Contribution to Canadian Agriculture and Agri-Food Sector GDP, 2005 33
B1.5 Provincial Employment in the Agriculture and Agri-Food System, 2005 34
B1.6 The Agriculture and Agri-Food System's Share of Provincial Employment, 2005 34
B1.7 Economy Multipliers for the Agriculture and Agri-Food Sector 35

B2 International Trade and Global Developments . . . . . .

B2.1 World Agriculture and Agri-Food Export Share by Country of Origin, 2006 38
B2.2 World Agriculture and Agri-Food Import Share by Country of Destination, 2006 38
B2.3 Canadian Agriculture and Agri-Food Export Sales (BICO), 1990-2006 39
B2.4 Canadian Agriculture and Agri-Food Import Sales (BICO), 1990-2006 39
B2.5 Exchange Rate Appreciation and Agriculture and Agri-Food Exports, 1992-2006 40
B2.6 Commodity Composition of Export Sales, 1991 and 2006 41
B2.7 Commodity Composition of Import Sales, 1991 and 2006 41
B2.8 Export Sales of Live Cattle and Beef, 1991-2006 42
B2.9 Export Sales of Live Hogs and Pork, 1990-2006 42
B2.10 Import Sales of Live Hogs and Pork, 1990-2006 42
B2.11 Share of Agriculture and Agri-Food Exports to North America 43
B2.12 Value of Canadian Agriculture and Agri-Food Exports by Country of Destination, 1990 and 2006 43
B2.13 Destinations of Canadian Agriculture and Agri-Food Exports, 2006 43
B2.14 Agriculture and Agri-Food Exports to North America and Rest of World, 1990-2006 44
B2.15 Agriculture and Agri-Food Imports from North America and Rest of World, 1990-2006 44
B2.16 Agriculture and Agri-Food Trade Balance with North America and Rest of World, 1990-2006 44
B2.17 Canadian Value of Agriculture and Agri-Food Exports to Emerging Countries, 1991-2006 . . . 45
B2.18 Increase in Middle Income Consumers, 1996-2006 45

B2.19 People Living Below US$1/Day and US$2/Day, 2004 45
B2.20 Value of Canadian Agriculture and Agri-Food Imports by Country of Origin, 2006 46
B2.21 Canadian Agriculture and Agri-Food Imports by Country of Origin, 2006 46

B3 Competitiveness, Productivity Growth and Innovation
B3.1 Canada's Share of World Agriculture and Agri-Food Trade, 1990-2004 48
B3.2 RTA for Live Bovine, 1995-2005 49
B3.3 RTA for Live Hogs, 1997-2005 49
B3.4 RTA for Beef, 1995-2005 50
B3.5 RTA for Pork, 1995-2005 50
B3.6 RTA for Grain Milling Products, 1997-2005 50
B3.7 Cost of Production as a Share of Food Processing Shipments Canada-U.S., 2003 51
B3.8 Hourly Compensation Costs in Food, Beverage and Tobacco Manufacturing, 1992-2004 51
B3.9 Total Factor Productivity Growth in Primary Agriculture, 1987-2005 52
B3.10 Total Factor Productivity Growth in Food Processing and Total Manufacturing, 1987-2005 52
B3.11 International Comparison of Total Factor Productivity Growth in Primary Agriculture, 1989-2003 53
B3.12 International Comparison of Total Factor Productivity Growth in Food and Beverage Processing, 1989-2003 53
B3.13 Wheat Yields, 1960-2004 54
B3.14 Pork Yields, 1995-2005 54
B3.15 Extent of Innovation in Food Processing , 2001-2003 55
B3.16 Extent of Collaboration with Supply Chain Partners, 2001-2003 55
B3.17 Private Industry's R&D Expenditures in the Agriculture and Agri-Food Sector, 1980-2005 . . 56
B3.18 Private Industry R&D Expenditures as a Share of GDP by Industry, 1980-2005 56
B3.19 Rates of Return to Public R&D in Agriculture 57
B3.20 Public R&D Support to Agri-Food Sector as a Share of Adjusted Value of Production, 1990-2006 57
B3.21 Business R&D Expenditures as a Share of Value Added in Food, Beverage and Tobacco in OECD Countries, 1994-2000 58
B3.22 Sources and Extent of R&D Expenditures in Food Processing, 2001-2003 58
B3.23 Impediments to Innovation in Food Processing, 2001-2003 59
B3.24 Extent to Which Government Programs are Used, 2001-2003 59
B3.25 Capital Stock in Food Processing, 1961-2006 60
B3.26 Total Stock of Public Infrastructure in Canada, 1961-2006 60
B3.27 Accumulated FDI in Canadian Food Processing Industry by Country of Origin, 1990-2003 61
B3.28 Accumulated FDI in Canadian Beverage Processing Industry by Country of Origin, 1990-2003 61
B3.29 Accumulated Outward Investment in Food Processing Industry by Country of Destination, 1990-2003 62
B3.30 Locations of McCain Foods International Plant Facilities, 2006 62

Section C Components of The Agriculture and Agri-Food System

C1 Consumers

C1.1 Personal Expenditures on Food, 1961-2005 66
C1.2 Personal Expenditures on Food as a Share of Total Food Expenditures, 1961-2005 66
C1.3 Household Expenditure Share of Food, Beverage and Tobacco in Selected OECD Countries, 2004 66
C1.4 Consumer Price Indices (CPI) for Food and all Goods and Services, 1981-2006 67
C1.5 Considerations for Food Purchased for the Home and when Dining Out, 2006 68
C1.6 Consumer Confidence in Safety of the Food Supply, 2004-2007 68
C1.7 Estimates of Organic Food Sales Retail Market Channels, 2006 69
C1.8 Estimates of Organic Food Sold in Canadian Supermarkets, 2006 69
C1.9 Price Differentials between Selected Organic and Conventional Foods, January 2004 70
C1.10 Consumer Preferences for Buying Meals Imported vs. Domestic 71
C1.11 Average Annual Growth Rate in Retail Sales of Packaged Products, 2002-2006 71

C2 Food Distribution (Retail, Wholesale and Foodservice)

C2.1 Distribution of Personal Expenditure on Goods, 2005 74
C2.2 Distribution of Personal Expenditure on Services, 2005 74
C2.3 Number of Canadian Food Stores and Average Sales, 1990-2006 75
C2.4 Market Share of Top 5 Food Retailers, Selected Countries, 1997-1999 75
C2.5 Average Profit Margin Ratio for Food and Beverage Retailers, 1991-2005 76
C2.6 Food Retail Channel Share, 2004 77
C2.7 Private Label Share in Canada, 1999-2005 77
C2.8 Where Canadians Eat Their Meals, 2005 78
C2.9 Household Spending on Food by Province, 2005 78
C2.10 Commercial Foodservice Sales and Number of Establishments, 1990-2005 79
C2.11 Market Share by Foodservice Category, 2006 79
C2.12 Top 50 Foodservice Companies' Share of Commercial Foodservice Sales, 1998-2004 80
C2.13 Commercial Restaurant Bankruptcies, 1991-2005 80

C3 Food, Beverage and Tobacco (FBT) Processing

C3.1 Food Processing Input Composition and Output Disposition, 2003 82
C3.2 Distribution of Total Manufacturing GDP by Sector, 2005 83
C3.3 Distribution of Total Manufacturing Employment by Sector, 2005 83
C3.4 Value of FBT Processing Shipments, 1992-2006 84
C3.5 Value of FBT Processing Shipments, 2006 84
C3.6 Growth in Shipment Value in Real Dollars by FBT Processing Industry, 1995-2006 84
C3.7 Distribution of FBT Processing Shipments and Number of Establishments by Employment Size, 2005* 85
C3.8 Share of Industry Shipments Accounted for by the Four Largest Firms (CR4), 1999 and 2003 85
C3.9 Price Margins Between Food Processing and Farm Level and Food Retailing, Beef, 1979-2003 86
C3.10 Price Margins Between Food Processing and Farm Level and Food Retailing, Wheat, 1979-2005 86
C3.11 Export Intensity in FBT Processing, OECD Countries, 1991-2002 86
C3.12 FBT Processing Export Intensities, by Sub-industry, 2006 87

C3.13 FBT Processing Import Intensities, by Sub-industry, 2006 . . . 87
C3.14 Profit Margin Ratio in Food and Total Manufacturing, 1999-2006 . . . 88
C3.15 Return on Equity Ratio in Food and Total Manufacturing, 1999-2006 . . . 88
C3.16 Debt to Equity Ratio in Food and Total Manufacturing, 1999-2006 . . . 88

C4 Primary Agriculture

C4.1 Disposition of the Value of Agricultural Production, 2003 . . . 90
C4.2 Provincial Shares of Farmland and Farms, 2006 . . . 91
C4.3 Number and Size of Farms, 2006 . . . 91
C4.4 Corn Consumption and Imports, 1991-2006 . . . 92
C4.5 Canadian and World Wheat Prices, 1991-2006 . . . 92
C4.6 Canadian and World Feed Grain Prices, 1991-2006 . . . 93
C4.7 Canadian Canola and Soybean Prices, 1991-2006 . . . 93
C4.8 The Cattle Price Cycle, 1980-2006 . . . 94
C4.9 Slaughter Cattle Marketing, 1980-2006 . . . 94
C4.10 Hog Price and Inventories, 1990-2006 . . . 95
C4.11 Hog Marketings and Margins, 1990-2006 . . . 95
C4.12 Chicken Disappearance and Imports, 1990-2006 . . . 95
C4.13 Farm Market Receipts by Commodity, 2006 Relative to Five-Year Average . . . 96
C4.14 Regional Farm Market Receipts, 2006 Relative to Five-Year Average . . . 96
C4.15 Farm Market Receipts by Commodity, 1990 and 2006 . . . 97
C4.16 Regional Farm Market Receipts by Commodity Share, 2006 . . . 97
C4.17 Evolution of Prairie Farm Market Receipts by Commodity, 1988 and 2006 . . . 98
C4.18 Evolution of Prairie Export Earnings by Commodity, 1988 and 2006 . . . 98
C4.19 Share of Production from Export Sales . . . 99
C4.20 Share of Farm Market Receipts from Export Sales for Canada, the U.S. and the EU, 1999-2005 . . . 99
C4.21 Program Payments, 1994-2006 . . . 100
C4.22 Net Cash Income, 1994-2006 . . . 100
C4.23 Value-Added in Agriculture, 1991-2006 . . . 101
C4.24 Distribution of Net Value-Added, 2006 . . . 101
C4.25 Distribution of Farms by Farm Size, 2006 . . . 102
C4.26 Distribution of Farms with $10,000 or more in Gross Farm Receipts by Typology Group, 2005 . . . 103
C4.27 Farm Business Goals of Canadian Operators Ranked as Their Most Important, 2004 . . . 104
C4.28 Average Farm Net Operating Income by Revenue Class, 2005 . . . 104
C4.29 Average Farm Net Operating Income by Province, 2005 . . . 105
C4.30 Average Farm Net Operating Income by Farm Type, 2005 . . . 105
C4.31 Average Farm* Operator Income by Income Source and Province, 2005 . . . 106
C4.32 Average Farm* Operator Income by Income Source and Farm Type, 2005 . . . 106
C4.33 Farm Typology Data, 2005 . . . 107
C4.34 Average Market Income and Program Payments for Farms with Gross Revenues of $250,000 and over, 1990 to 2005 . . . 108
C4.35 Average Market Income Less CCA and Program Payments for Farms with Gross Revenues of $250,000 and over, 1990-2005 . . . 108
C4.36 Net Income of Saskatchewan Grain & Oilseed Farms, $250,000 to $500,000 Revenue Class, 2001-2005 . . . 109

C4.37 Revenue and Expenses for Dairy Farms, 2005 110
C4.38 Selected Average Expenses of Saskatchewan Grain & Oilseed Farms, $250,000 to $500,000 Sales Class, 2001 - 2005 110
C4.39 Gross Margin Ratios Reported by High and Low Performance Farms by Typology, 2005 ... 111
C4.40 Average Farm Total Net Worth, 1995-2005 112
C4.41 Average Farm Total Net Worth by Province, 2003-2005 112
C4.42 Average Assets, Liabilities and Net Worth by Farm Type, 2005 113
C4.43 Average Quota Holdings of Supply Managed Farms, 1993-2005 113
C4.44 Debt to Asset Ratios for Farms, Canada, 1995-2005 114
C4.45 Debt to Asset Ratios by Province, 2005 114
C4.46 Debt to Asset Ratios by Farm Type, 2005 114
C4.47 Financial Stress, 2005 115
C4.48 Average Farm Family Income by Revenue Class, 2004 116
C4.49 Average Farm Family Income by Province, 2004 116
C4.50 Average Farm Family Income by Farm Type, 2004 116
C4.51 Average Income of Farm Families by Source of Income by Four Sales Classes, 2005 117
C4.52 Off-Farm Income and Net Operating Income of Farm Families by Province, 2004 117
C4.53 Off-Farm Income and Net Operating Income of Farm Families by Farm Type, 2004 117
C4.54 Prevalence of Negative Net Farm Income and Low Family Income, 1983 to 2003 118
C4.55 Distribution of Farm Families, 2004 118
C4.56 Number of Years Farm Families Reported Low Family Income Between 1994 and 2003 119
C4.57 Average Family Income, 2004 119

C5 Agricultural Input and Service Suppliers

C5.1 The Value Chain of Agriculture Specific Input and Service Suppliers 120
C5.2 Farm Input Prices and Farm Product Prices, 1971-2005 121
C5.3 Farm Net Operating Expenses and Depreciation, 2006 121
C5.4 Farm Expenses on Machinery Fuel, 1980-2006 122
C5.5 Nitrogen Ammonia & Natural Gas Prices, 1996-2006 122
C5.6 Chemical Input Usage in Farming, 1971-2005 122
C5.7 Market Shares of Co-operatives in Farm Supplies, 1986-2004 123
C5.8 Co-operative Supply Sales, 2004 123

Section D Government and the Agriculture and Agri-Food Sector

D1 Government Expenditures in Canada

D1.1 Government Expenditures in Support of the Agriculture and Agri-Food Sector, 1985-86 to 2006-07 Fiscal Years 128
D1.2 Government Expenditures in Support of the Agriculture and Agri-Food Sector by Province, 2006-07 Fiscal Year 128
D1.3 Government Expenditures in the Agriculture and Agri-Food Sector as a Share of Sector GDP by Province, 2006-07 Fiscal Year 128
D1.4 Federal Government Expenditures in Support of the Agriculture and Agri-Food Sector by Major Category, 2006-07 Fiscal Year 129
D1.5 Provincial Government Expenditures in Support of the Agriculture and Agri-Food Sector by Major Category, 2006-07 Fiscal Year 129
D1.6 Government Research Expenditures on Agriculture, 1990-91 to 2006-07 Fiscal Years 130

D1.7 Public R&D Support to Agri-Food Sector as a Share of Adjusted Value of Production, 1990-2006 130
D1.8 Total Stock of Public Infrastructure in Canada, 1961-2006 131
D1.9 Transportation Infrastructure Share of each Level of Government, 1961-2000 131
D1.10 Support to Farm Producers through Tax Rebates and Exemptions, 1990-91 to 2006-07 Fiscal Years 132
D1.11 Combined Federal/Provincial Corporate Income Tax Rates for Manufacturers and Processors, Ontario and Quebec: 1960-2005 132

D2 Producer Support Estimates (PSE) and Agricultural Policies in Canada and Other Countries

D2.1 Producer Support Estimate, 1986-2006 134
D2.2 Composition of the PSE by Commodity Specificity, Canada 134
D2.3 Composition of the PSE by Commodity Specificity, EU(25) 135
D2.4 Composition of the PSE by Commodity Specificity, U.S. 135

FOREWORD

This 2007 report provides an economic overview of the Canadian agriculture and agri-food system. It begins with two special features that provide information from the 2006 Census of Agriculture and on the new industrial uses of agricultural products. It continues by looking at the contribution of the system to the whole economy, then reviews each segment of the system, going upstream from consumers to food distribution, food, beverage and tobacco (FBT) processing, primary agriculture, all the way to input supply. It concludes with a review of government expenditures in support of agriculture.

Charts and tables with brief accompanying texts are used to summarize information and to provide base performance indicators.

This report is meant to be a multi-purpose reference document to provide:

- an introduction to the agriculture and agri-food system;
- a snapshot of structural changes that are occurring throughout the system in response to various factors; and
- background data and information to inform public discussions on challenges and opportunities facing Canadian agriculture.

The report describes the Canadian agriculture and agri-food system as a highly complex, integrated, internationally competitive and growing part of the Canadian economy. It is a resilient system, responding to the challenges and opportunities it faces by restructuring and adapting to changing consumer demands, advancing technology, increased demand for non-food and non-feed products, North American integration and globalization.

HIGHLIGHTS

- The agriculture and agri-food system encompasses the farm input market, primary agriculture, food, beverage and tobacco processing and wholesale and retail sectors. It continues to play an important role in the Canadian and provincial economies, making significant contributions to Gross Domestic Product (GDP) and employment. It directly provided one in eight jobs and accounted for 8% of total GDP in 2005.

- Export opportunities are critical for the growth of most agriculture and agri-food industries. In 2006, Canada was the fourth-largest exporter and fifth-largest importer of agriculture and agri-food products in the world, with exports and imports valued at $28 billion and $22 billion respectively.

- The system is becoming more internationally focussed with Canada's share of world agriculture and agri-food trade increasing over the past 15 years in response to trade liberalization. The composition of the system's trade has also changed with increasing exports of value-added goods that meet changing international demands.

- Changing consumer demands are influencing changes throughout the whole agriculture and agri-food system. Consumers are demanding more variety, more convenience and healthier food choices, accompanied by proper assurances of quality and safety. Canadians also enjoy some of the lowest food costs in the world, with food accounting for only 10% of personal household expenditures in recent years.

- In response to challenges and changing market conditions, the agriculture and agri-food sector has gone through considerable transformation with a continued trend towards fewer, larger farms and firms and increased concentration. There is also an increasing number of farms and firms diversifying production, growing organic products and adopting environmentally-friendly production methods.

- The demand for biofuels has also created opportunities and challenges for agricultural producers through increased demand for agricultural commodities as inputs and increased feedstock prices.

- The agriculture and agri-food sector also continuously searches for innovative products such as bio-products and functional foods and nutraceutical (FFN) products that may provide an excellent market opportunity to diversify and meet challenges in a competitive global market.

- The prosperity of the sector depends on its ability to be productive and competitive. Although Canada has become more competitive in the trade of various agricultural and agri-food products, it is less cost competitive in several products in relation to its major competitors.

- Innovation is a key determinant of competitiveness, with research and development (R&D) as a major input to innovation. R&D spending in the agriculture and agri-food sector has been increasing over time. However, R&D intensity in the food manufacturing industry has been lower than that of total manufacturing.

- While primary agriculture accounts for a small share of the total economy, it is at the heart of the agriculture and agri-food system. Any changes in commodity markets can therefore have impacts on the performance of primary agriculture and throughout the supply chain.

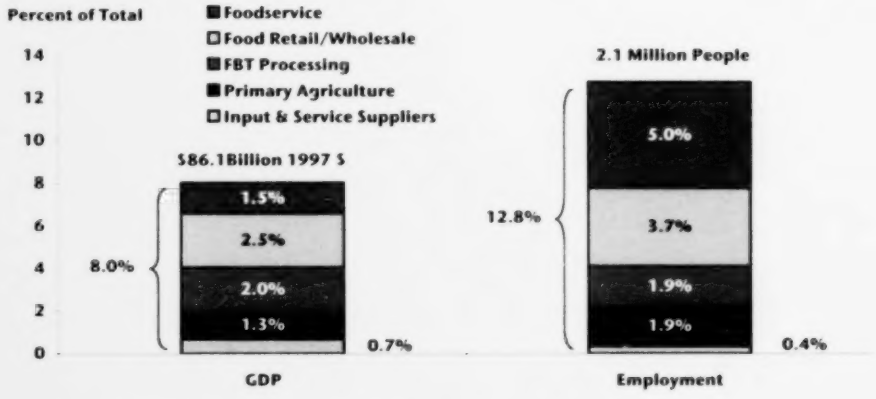
- Canadian farms differ by typology, size, scale and farm type and have different management skills and business strategies. Differences in performance between farms can be explained by this diversity.

- Farm income varies by sector, region and typology. On average, high performance farms tend to have better cost control, which along with support from government policies and programs help them manage financial difficulties.
- Another significant challenge to primary agriculture is the aging farm operator population. The share of operators over the age of 54 climbed to 40% in 2006.
- Food, beverage and tobacco (FBT) processing is a group of industries that is integrated with the farm, wholesale and retail sectors, and one of the most important manufacturing sectors in Canada.
- FBT processing is growing at a slower rate than in the past and current challenges to the sector have led to weaker but stable profits.
- Input suppliers and service providers also perform important functions in the agriculture and agri-food system. In 2006, producers spent over $36 billion on operating expenses, with input supplies and services constituting the largest part of expenses. In addition to already large input expenses, recent increases in the costs of fuel, fertilizer and pesticides are putting added pressure on farm income. Recent increases in feed prices have also added to the financial pressures for livestock farms.
- Total government (federal and provincial) support to the agriculture and agri-food sector rose to a record high level in 2006-2007 at an estimated value of $8.4 billion or 40% of total sector GDP.
- Program payments continue to account for the largest portion of both federal and provincial government expenditures in support of the sector in 2006-2007, followed by spending on research and inspection.
- Government support to the sector varies across provinces. On the basis of government support as a percentage of agricultural GDP, farmers in Prince Edward Island, Saskatchewan and Manitoba received the most support.
- Agricultural policies in Canada and other countries have evolved over time. Some countries have made major reforms to their agricultural policies, leading to reductions in levels of support and modifications to the types of support provided.
- Canada's Producer Support Estimate (PSE) for all commodities was estimated at 21% in 2005 compared to 16% for the U.S. and 33% for the EU(15). Canada's total Aggregate Measure of Support (AMS) has increased in recent years, while that of the U.S. and the EU(15) has declined.

The system is complex and highly integrated

While the relative contribution of Canadian agriculture to the overall economy has been declining, the absolute size of the sector has continued to grow. It continues to play a significant role in the economy, particularly when the whole supply chain is considered. The agriculture and agri-food system contributed $86 billion (constant 1997 dollars) or 8% to the Canadian economy and employed 2.1 million Canadians in 2005. This complex, integrated production and distribution system includes input and service suppliers, primary agriculture producers, food, beverage and tobacco (FBT) processors, food retailers and wholesalers, and foodservice providers.

The Agriculture and Agri-Food System's Contribution to GDP and Employment, 2005

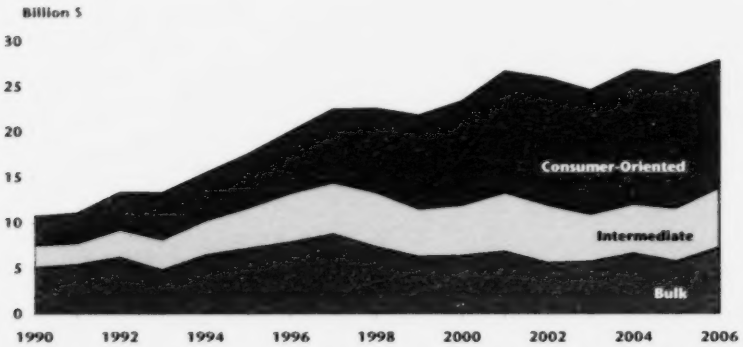


Source: Statistics Canada and AAFC calculations.

The importance of agriculture and agri-food varies across the provinces, with food processing being more important in Central and Eastern Canada, and primary agriculture more important in the Prairies.

The agriculture and agri-food system has been growing at an average rate of 2.4% per year over the past decade with most of the growth occurring in FBT processing, food retail/wholesale and foodservice. Growth in the system has been driven partly by export growth, and in particular by exports of consumer-oriented products. In 2006, total sector export sales reached $28 billion, 50% of which were consumer-oriented products.

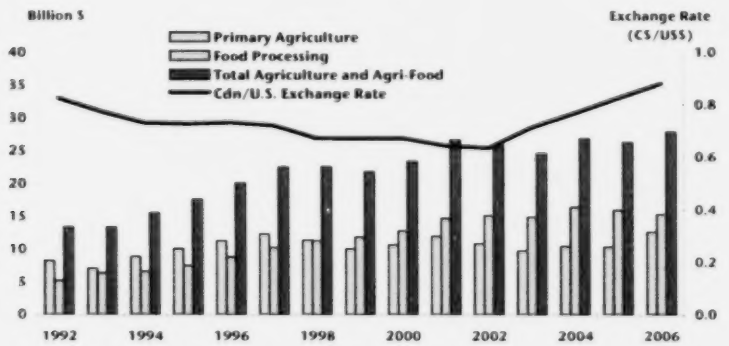
Canadian Agriculture and Agri-Food Export Sales (BICO), 1990-2006



Source: Statistics Canada and AAFC calculations

Canada, as a major player in world agri-food trade has increased its share of world agriculture and agri-food trade in response to trade liberalization and changing market conditions over the past 15 years. The North American Free Trade Agreement (NAFTA), in particular, has led to increasingly integrated agriculture and agri-food trade within the North American market as demonstrated by the quadrupling of exports to the U.S. and a nine-fold increase in exports to Mexico since 1991. However, the recent appreciation of the Canadian dollar is now presenting challenges to exports.

Exchange Rate Appreciation and Agriculture and Agri-Food Exports, 1992-2006



Source: Statistics Canada and AAFC calculations

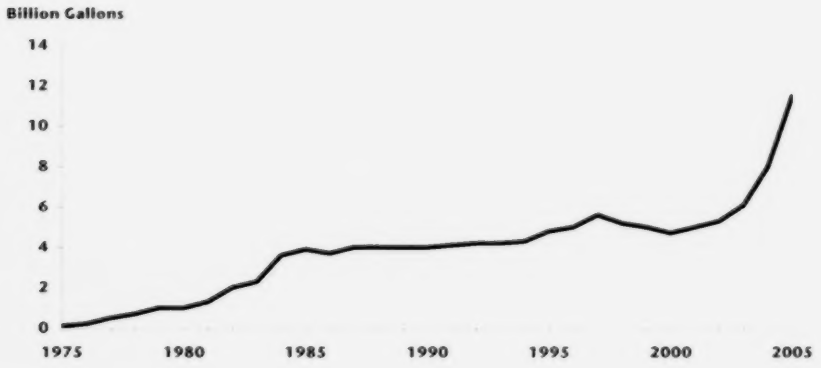
Other developments that have led to challenges and opportunities for the sector include:

- Changing consumer demands
- Increasing demand for biofuel, and
- Increasing international competition from emerging economies.

Changing consumer demands in domestic and international markets are affecting the entire agriculture and agri-food system as consumers in Canada and elsewhere are demanding more variety, convenience and healthier food choices, accompanied by proper assurances of quality and safety. Societal concerns for the environment and the humane treatment of animals are also influencing the demand for food. The development of innovative products such as functional foods and nutraceuticals (FFN) may help address some of the consumer concerns and provide an excellent opportunity for the sector to manage competitive pressures.

The growth in global biofuel production has also created opportunities and challenges for agricultural producers as the increased demand for feedgrains and oilseeds as feedstock, has resulted in a rise in these prices. While higher prices translate into higher farm incomes for grain and oilseed producers, they also have a negative impact on livestock producers who are paying higher prices for feed.

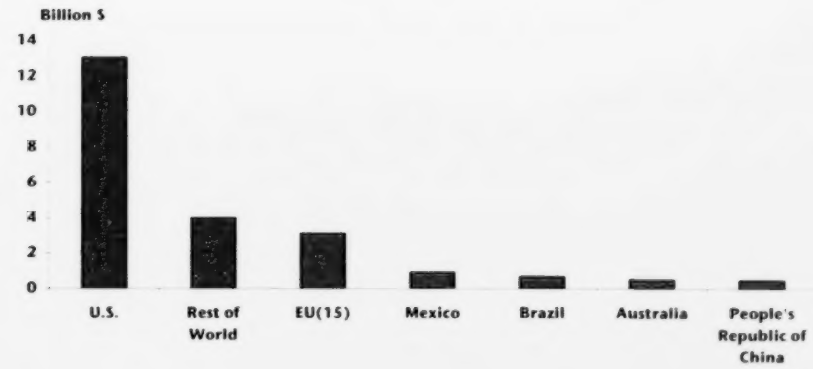
World Ethanol Production, 1975-2005



Source: www.earthtrends.com

Increased competition from emerging economies such as India, China and Brazil is another major challenge to the Canadian agriculture and agri-food system. Canada is now importing more agriculture and agri-food products from both traditional and non-traditional trading partners.

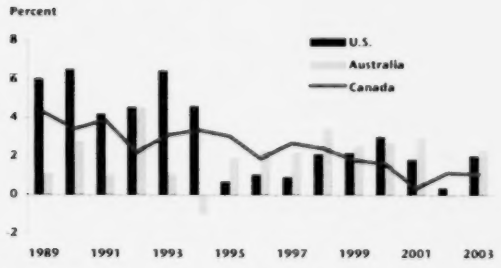
Value of Canadian Agriculture and Agri-Food Imports by Country of Origin, 2006



Source: Statistics Canada and AAFC calculations.

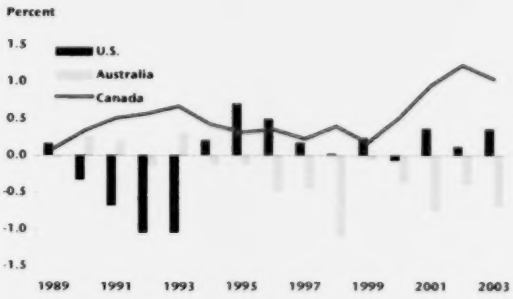
In order to be able to compete against these new competitors, the sector needs to be productive and innovative. Productivity growth in primary agriculture has slowed down, while food processing has been on an upward trend, and has surpassed the U.S. and Australia until recently.

International Comparison of Total Factor Productivity Growth in Primary Agriculture, 1989-2003



Source: Groningen Growth and Development Centre, Industry Growth Accounting Database, 2006.
Note: Includes forestry and fishing.
Ten-year simple moving average.

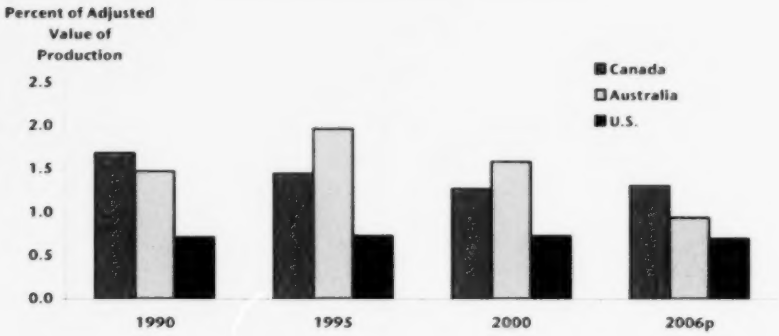
International Comparison of Total Factor Productivity Growth in Food and Beverage Processing, 1989-2003



Source: Groningen Growth and Development Centre, Industry Growth Accounting Database, 2006.
Note: Ten-year simple moving average.

Research and Development (R&D) spending is an important input to innovation and productivity growth. However, Canada's public R&D spending as a share of production, declined from 1.7% in 1990 to 1.3% in 2005, while private R&D spending as a share of sector GDP has remained low at less than 1%.

Public R&D Support to Agri-Food Sector as a Share of Adjusted Value of Production, 1990-2006

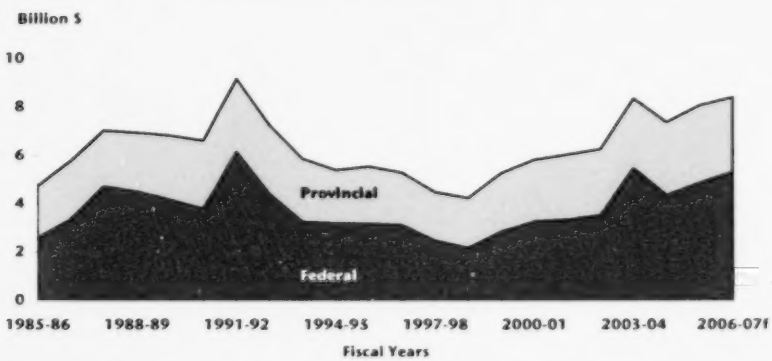


Source: Agricultural Policies in OECD Countries: Monitoring and Evaluation 2007.

Note: 2006 figures are preliminary.

Government support continues to play an important role in facilitating the sector to meet challenges and take advantage of emerging opportunities. Government expenditures in support of the agriculture and agri-food sector have grown in absolute terms over time, but have declined as a share of GDP. In the 2006-2007 fiscal year, government expenditures in support of the sector were estimated at $8.4 billion and 40% of sector GDP, which is slightly lower than in 2003-2004. Program payments accounted for 51% of government expenditures to the sector. In the past few years, government support to Canadian producers as a percentage of adjusted value of production has been higher than that of the U.S., but lower than that of the EU(15).

Government Expenditures in Support of the Agriculture and Agri-Food Sector, 1985-86 to 2006-07 Fiscal Years

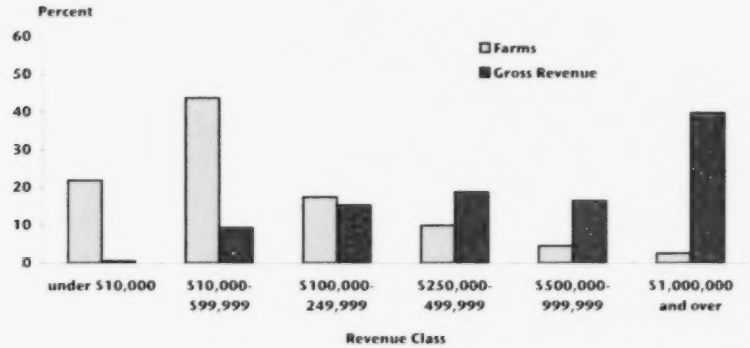


Source: AAFC.

Note: 2006-07 figures are forecasts.

The sector is responding to the challenges and opportunities through continuous structural adjustment as all components of the sector have diversified and become more consolidated. According to Statistics Canada's Census of Agriculture, farm numbers have continued to decline while average farm size has increased over time in all provinces. Although larger farms (farms with $250,000 or more in gross revenues) represented 17% of all farms in 2006, they accounted for almost 60% of total production. Ten years ago, larger farms represented 10% of all farms and 56% of total production. Small farms with revenues below $250,000 have fallen from 90% to 83% of farms over this same period.

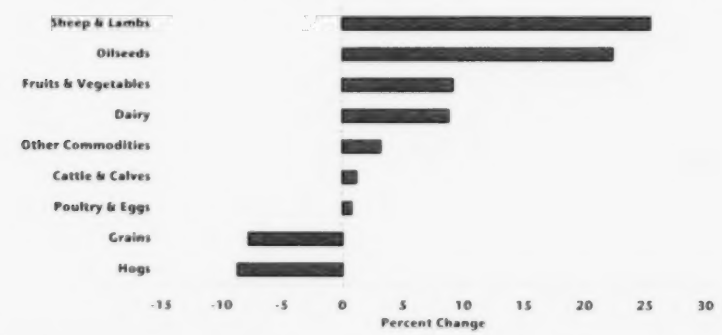
Share of Farms and Gross Farm Revenues by Farm Size, 2006



Source: Statistics Canada, 2006 Census of Agriculture

The performance of the sector reflects recent challenges, such as the appreciating dollar and rising commodity prices. In 2006, farm market receipts for most commodities increased relative to the five-year average. Program payments, which are important for stabilizing farm income, declined.

Farm Market Receipts by Commodity, 2006 Relative to Five-Year Average



Source: Statistics Canada

Structural adjustment has also been observed in the food processing and food retailing sectors. In 2005, large food processing establishments (those with 200 or more employees) accounted for only 10% of the total number of establishments, but accounted for 54% of the total production. In the food retailing sector, about 60% of national grocery sales were accounted for by the five largest retailers in Canada in the late 1990s, an increase from 50% a decade earlier.

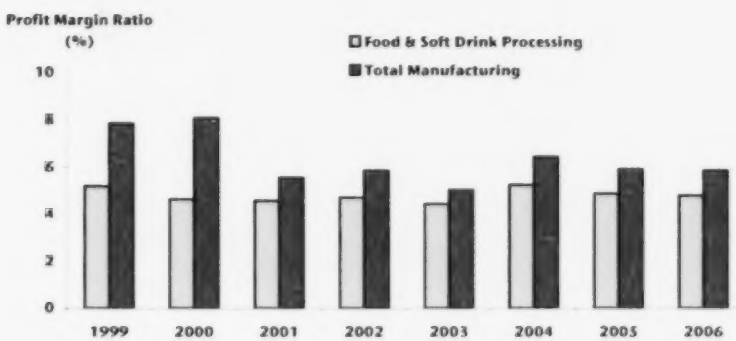
Distribution of FBT Processing Shipments and Number of Establishments by Employment Size, 2005*

Source: Statistics Canada.

Note: * This is not comparable to previous information due to changes in definitions.

Restructuring has allowed profit margins in both food processing and food retailing sectors to remain stable. This is a reflection of both industries' efforts to maintain profitability even under extreme cost pressures and competitive conditions. Since the late 1990s, profit margins in food and soft drink processing have hovered around 4.8% while the food and beverage retailing sector has seen profit margins of about 2.8%.

Profit Margin Ratio in Food and Total Manufacturing, 1999-2006



Source: Statistics Canada.

Note: See glossary for definition of the profit margin ratio.

SECTION A

Special Features

SECTION A1

Census of Agriculture Summary

The agricultural sector is undergoing significant transformation and facing constant challenges. There is a continued trend toward fewer and larger farms. The production of agricultural commodities in Canada is becoming more concentrated on larger farms as the share of production of these large farms has grown in recent years. The type of crops and livestock produced are changing, reflecting changes in the types of products consumers are demanding. There is an increasing number of farms growing organic products and adopting environmentally-friendly farm practices.

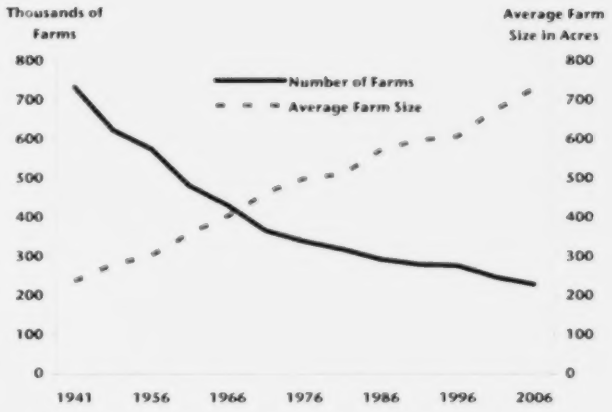
Farms continue to grow in size as they decline in number

- **Over the past 50 years, average farm size has tripled while the number of farms in Canada has declined.**

  In 2006, there were 229,373 farms, representing a 7% decline from 2001. This compares to a 11% decline between 1996 and 2001.

  At the same time, the average farm size is becoming larger. Technological advances and increasing productivity have enabled increasing scale of operations and consolidation.

Chart A1.1
Number and Size of Farms in Canada, 1941-2006

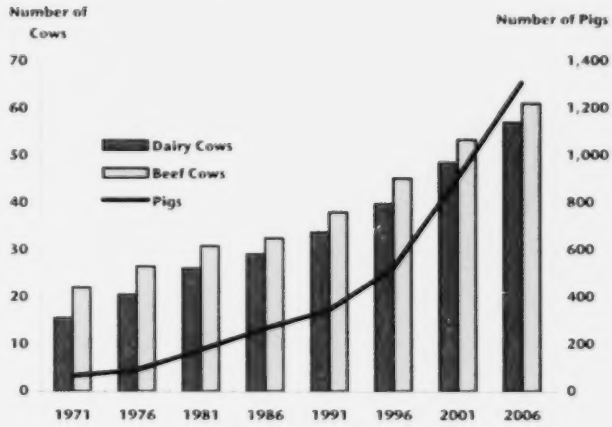


Source: Statistics Canada, Census of Agriculture, various years.

- **In 2006, farms which reported pigs continued to have the largest average herd size (1,308 pigs per farm) and herd size grew by 150% over the last 10 years. Average herd size continues to increase due to consolidation and expansion.**

  Among cattle herds, farms reporting dairy cows averaged 57 cows per farm, a 44% increase over the last 10 years. The average herd size of farms reporting beef cattle is slightly higher at 61 cows per farm, but growing somewhat slower at 35% over the last 10 years.

Chart A1.2
Average Herd Size, 1971-2006



Source: Statistics Canada, Census of Agriculture, various years.

Average area per farm has continued to increase in all provinces, while total area of farmland remains unchanged

- **Total farmland in Canada remained relatively unchanged in 2006, with the largest changes in the coastal provinces.**

Farmland area in British Columbia increased by 10% between 2001 and 2006, nearly the highest growth rate across Canada. Newfoundland farm acreage decreased the most, by 11% during the same time period.

Average farm size, in terms of acres, continues to increase as farms are becoming larger. Saskatchewan farms remain the largest with an average land area of 1,449 acres, an increase of 13% since 2001. Newfoundland farms are the smallest with an average land area of 160 acres, an increase of 3% from 2001.

Chart A1.3
Number and Size of Farms, 2006

	Farmland (Thousand Acres)			Average Farm Size (Acres)		
	2001	2006	Percent Change	2001	2006	Percent Change
Canada	**166,802**	**166,984**	**0%**	**676**	**728**	**8%**
N.L.	100	89	-11%	156	160	3%
P.E.I.	646	621	-4%	350	365	4%
N.S.	1,006	994	-1%	256	262	2%
N.B.	959	977	2%	316	352	11%
Que.	8,444	8,558	1%	263	279	6%
Ont.	13,507	13,330	-1%	226	233	3%
Man.	18,784	19,073	2%	891	1,001	12%
Sask.	64,904	64,233	-1%	1,283	1,449	13%
Alta.	52,059	52,150	0%	970	1,055	9%
B.C.	6,393	7,005	10%	315	353	12%

Source: Statistics Canada, 2001 and 2006 Censuses of Agriculture.

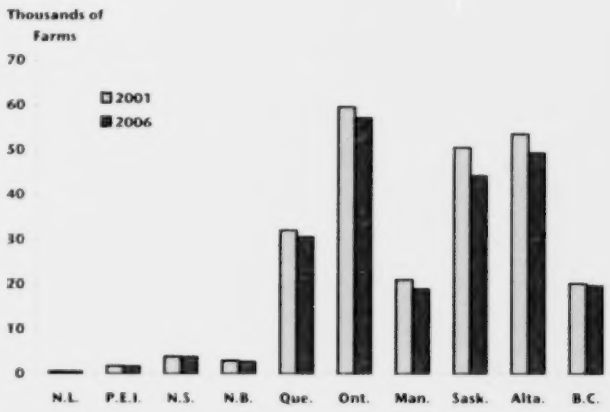
The distribution of farms and gross farm receipts by province has remained relatively constant since the last census

- **The number of farms decreased in all provinces in 2006.**

  Ontario had the most farms at 57,211. Saskatchewan and Newfoundland reported the largest decline in the number of farms at 12% and 13% respectively. British Columbia reported the lowest decline at 2%.

Chart A1.4

Number of Farms by Province, 2001 and 2006



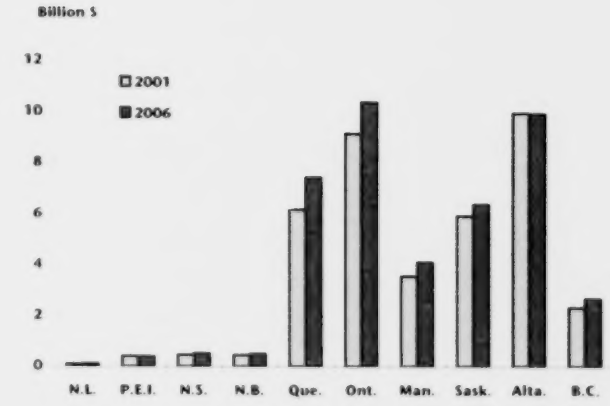
Source: Statistics Canada, 2001 and 2006 Censuses of Agriculture

- **Between 2001 and 2006, farm receipts increased in every province except Prince Edward Island and Alberta.**

  In Quebec, Ontario and Manitoba, farm receipts were the fastest growing, increasing by 21%, 18% and 15% respectively between 2001 and 2006.

Chart A1.5

Gross Farm Revenues by Province, 2001 and 2006



Source: Statistics Canada, 2001 and 2006 Censuses of Agriculture

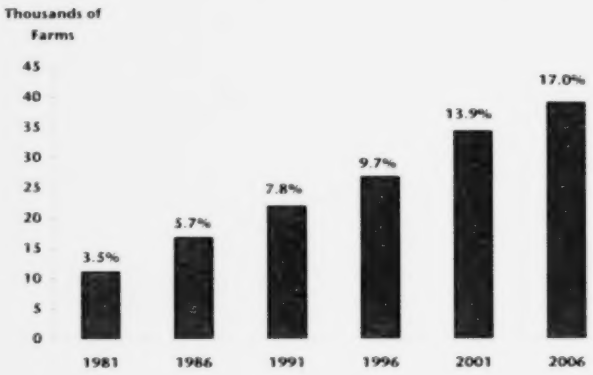
Farms are expanding and becoming larger in size

- **The number of farms reporting $250,000 or more in gross farm receipts continues to increase.**

  These farms represented 17% of all farms in 2006 compared to 3% in 1981. This trend is expected to continue as farms expand and become larger to capture economies of scale and improve their competitiveness in the world economy.

Chart A1.6

Number and Percent of Census Farms with Gross Farm Receipts of $250,000 and over*, 1981-2006



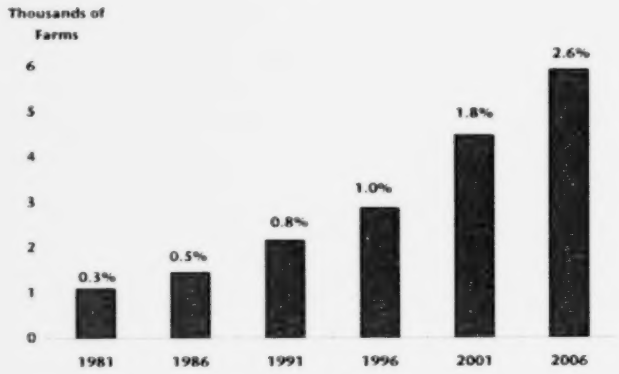
Source: Statistics Canada, Census of Agriculture, various years.
Note: *At constant 2005 prices.

- **There are substantially more farms with gross farm receipts of $1 million or more.**

  In 2006, there were 5,902 farms or 2.6% of all farms in Canada in this category, compared to 1,080 farms in 1981.

Chart A1.7

Number and Percent of Census Farms with Gross Farm Receipts of One Million Dollars and over*, 1981-2006



Source: Statistics Canada, Census of Agriculture, various years.
Note: *At constant 2005 prices.

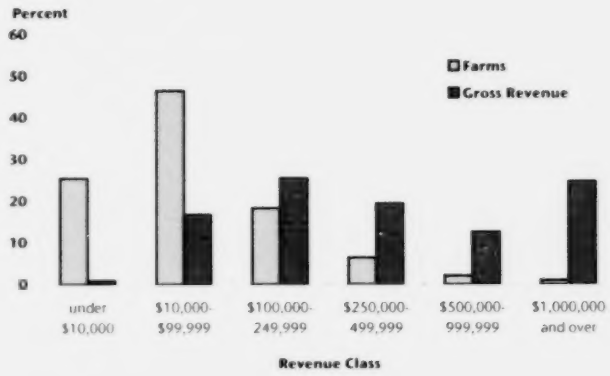
Production is increasingly concentrated on larger farms

- **Larger farms, which make up a small share of all farms, now account for a greater share of production.**

  In 1996, farms with less than $100,000 in farm receipts represented 72% of all farms and accounted for 8% of all farm receipts, while farms with more than $250,000 in sales represented 10% of all farms and 56% of total farm receipts.

Chart A1.8

Share of Farms and Gross Farm Revenues by Farm Size, 1996

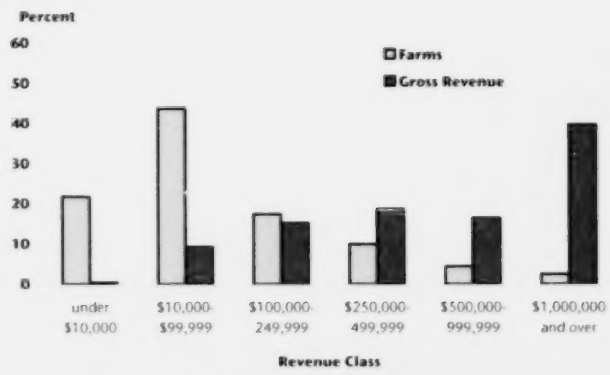


Source: Statistics Canada, 1996 Census of Agriculture.

- **In 2006, farms with less than $100,000 in farm receipts represented 66% of all farms and accounted for 5% of all farm receipts,** whereas farms with more than $250,000 in farm receipts represented 17% of all farms but contributed almost 75% to total farm receipts.

Chart A1.9

Share of Farms and Gross Farm Revenues by Farm Size, 2006



Source: Statistics Canada, 2006 Census of Agriculture.

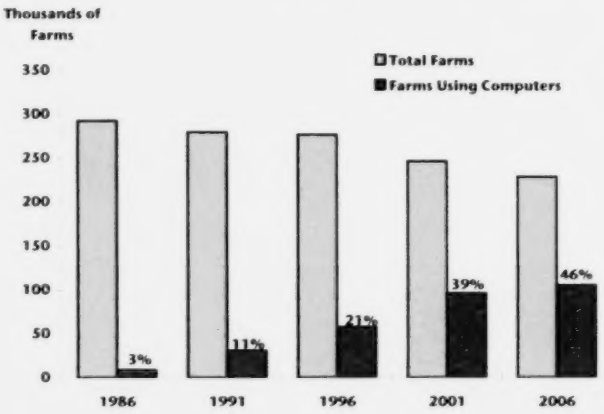
More producers are using computers and the internet to manage farm business

- **In 2006, 46% of farms reported using a computer in the management of their farm business.**

  Computer use varies by farm size. Only 35% of farms with less than $25,000 in gross farm receipts reported computer use, while 78% of farms with $500,000 or more in farm receipts reported computer use in the management of their business.

Chart A1.10

Number of Farms Using Computers for Business, 1986-2006

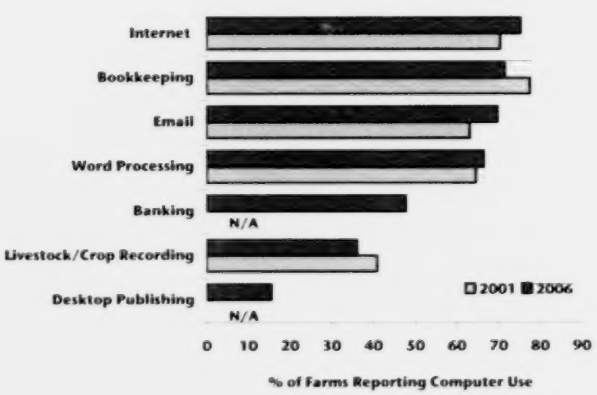


Source: Statistics Canada, Census of Agriculture, various years.

- **In 2006, 75% of the farms reporting computer use indicated that it was used to access the internet. The use of internet banking was reported by 48% of the computer users.**

Chart A1.11

Computer Application Use, 2001 and 2006



Source: Statistics Canada, 2001 and 2006 Censuses of Agriculture.

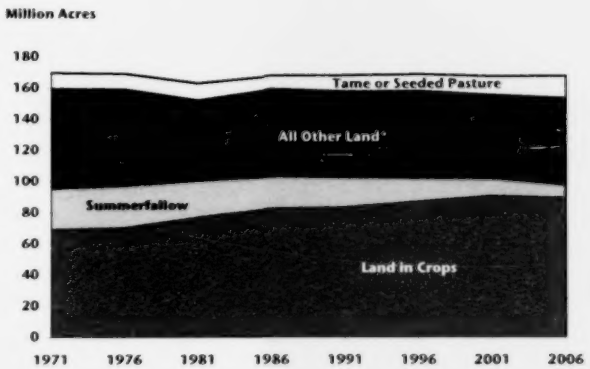
Technological change and better land management reduce the need for summerfallow

- **As farmers adopt environmentally-friendly land management practices such as no-till seeding and conservation tillage, summerfallow has declined.**

  Summerfallow decreased by 25% between 2001 and 2006. Saskatchewan had 9% of its total farm land in summerfallow in 2006, down from 11.9% in 2001.

  Summerfallow is used mostly in the Prairies to replenish nutrients in the soil.

Chart A1.12
Land Use, 1971-2006

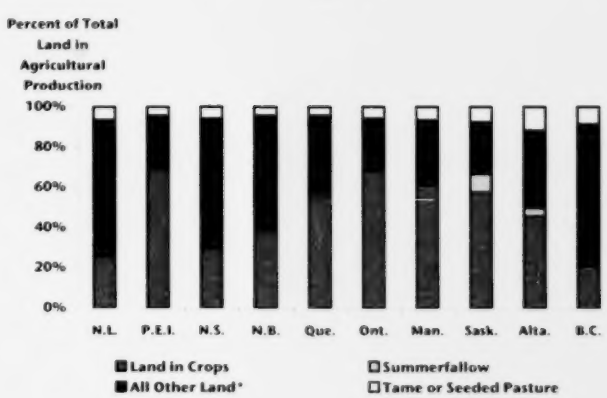


Source: Statistics Canada, 2006 Census of Agriculture.
Note: *Including Christmas tree area, natural land for pasture, woodlands and wetlands.

- **A marginal drop in cropland by 1% in 2006 from 2001 reflects a shift to seeded or tame pasture.**

  Pasture land increased by 19% between 2001 and 2006 to 14.1 million acres, as some cropland and summerfallow land was converted to seeded pasture and other land uses.

Chart A1.13
Land Use, 2006



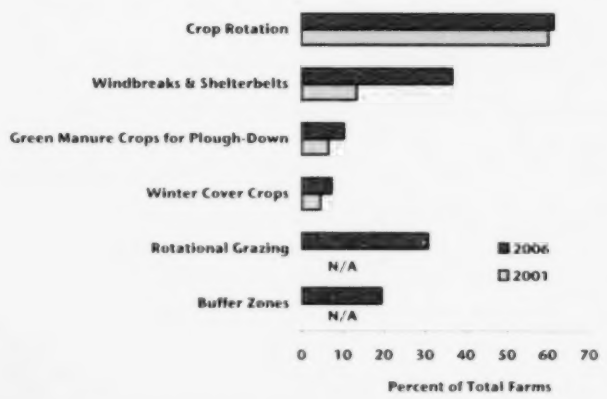
Source: Statistics Canada, 2006 Census of Agriculture.
Note: *Including Christmas tree area, natural land for pasture, woodlands and wetlands.

More farmers are adopting environmentally-friendly farm practices

- **More farmers report using soil conservation practices since the last census.**

  Crop rotation remains the most common soil conservation practice, followed by windbreaks and rotational grazing.

Chart A1.14
Soil Conservation Practices, 2001 and 2006

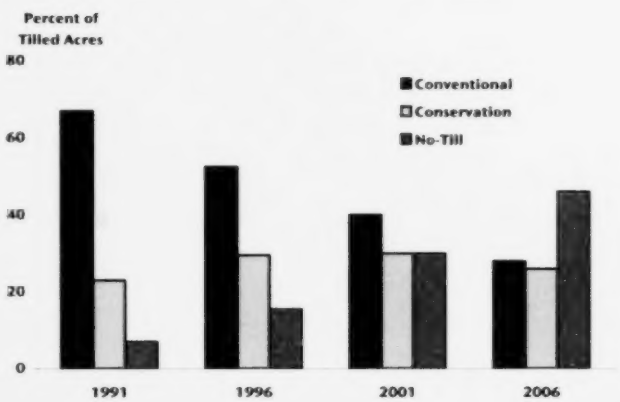


Source: Statistics Canada, 2001 and 2006 Censuses of Agriculture.

- **No-till practices are becoming more popular as they reduce input costs and soil erosion from wind and water.**

  No-till practices increased by 52% between 2001 and 2006. Conventional tillage decreased by 32%. In 2006, about 70% of cropland was cultivated using no-till or conservation tillage.

Chart A1.15
Tillage Practices in Canada, 1991-2006



Source: Statistics Canada, Census of Agriculture, various years.

Farmers are shifting to oilseeds, away from traditional crops such as wheat and other grains

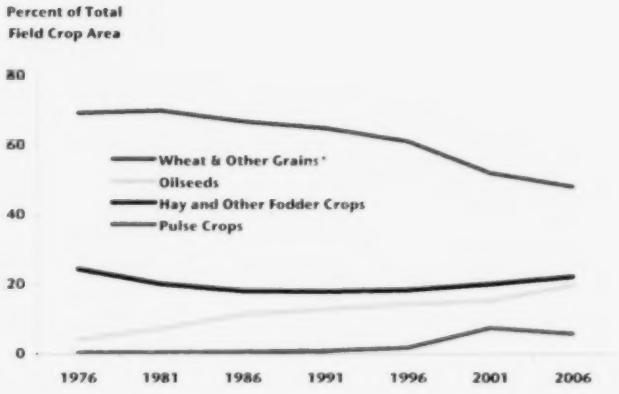
- **As total area planted to wheat and other grains has declined, oilseed acreage has increased.**

The proportion of crop land in oilseeds has increased almost sixfold since 1976. Area planted to canola, the most dominant oilseed in Canada, has increased by one-third since 2001. Increased demand for canola oil for its health benefits and its use for the production of bio-diesel partially explain this increase.

Wheat accounts for the largest crop area with 48% of the total area. This is despite a 10% decline in wheat acreage since 2001. This census data was collected in 2006 before the recent corn price increase in 2007, which may result in an even lower wheat area.

Chart A1.16

Acreage Allocation to Various Crops, 1976-2006



Source: Statistics Canada, Census of Agriculture, various years.

Note: *Other grains include oats, barley, mixed grains, corn for grain, rye and buckwheat.

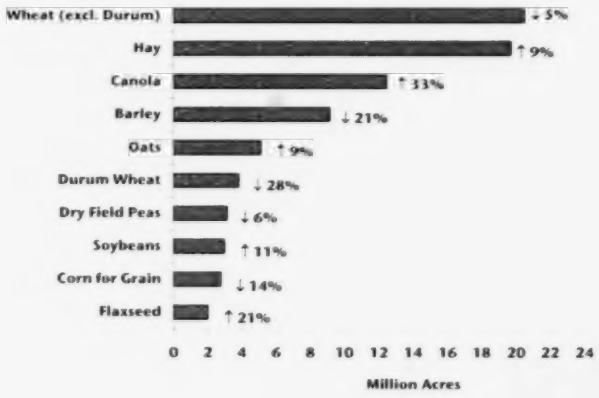
- **Area planted to pulse crops such as dry field peas, lentils and field beans increased by 190% between 1996 and 2001 but declined by 22% from 2001 to 2006.**

Pulse crops accounted for 6% of total field crop area in 2006. The decline in area planted to pulse crops can be partially explained by recent U.S. policy changes, which led to U.S. expansion and a decline in prices.

Hay, which is the second largest crop in Canada, increased by 9% from 2001 to 2006 due to an expanding livestock herd.

Chart A1.17

Acreage Allocation to Various Crops, 2006



Source: Statistics Canada, 2006 Census of Agriculture.

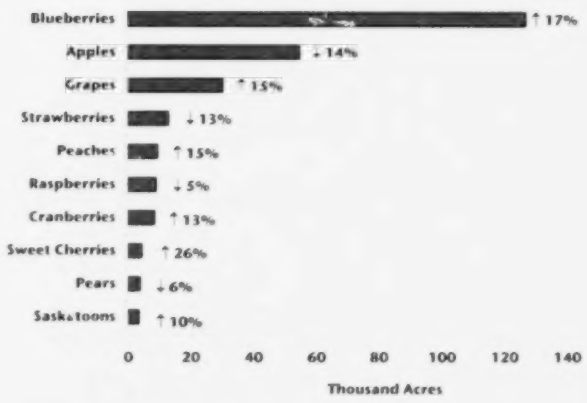
Acreage allocation is shifting as consumer preferences change

- **Total fruit area in Canada increased by 5% between 2001 and 2006, largely due to significant increases in the production of blueberries and grapes.**

  Total area in apple production, however, decreased by 14% during the same period, but still accounts for more than 54,000 acres.

Chart A1.18

Acreage Allocation to Major Fruits, 2006



Source: Statistics Canada, 2006 Census of Agriculture

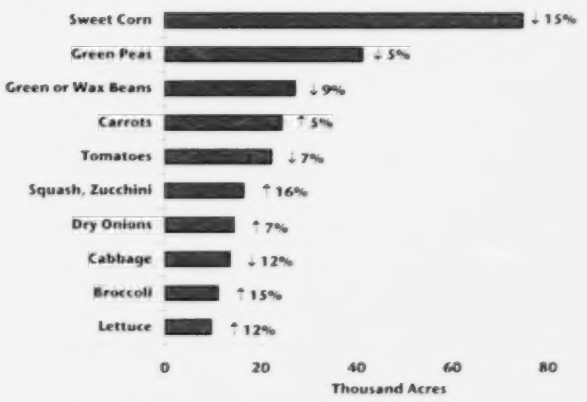
- **A switch to greenhouse production of vegetables, rising imports and closed-down domestic processing facilities contributed to the decline in vegetable acreage.**

  Between 2001 and 2006, the total area in vegetables decreased by 7% in Canada.

  Sweet corn, which decreased by 15% between 2001 and 2006, is still the most common vegetable accounting for 24% of the total vegetable area.

Chart A1.19

Acreage Allocation to Major Field Vegetables, 2006



Source: Statistics Canada, 2006 Census of Agriculture

The greenhouse industry has expanded dramatically

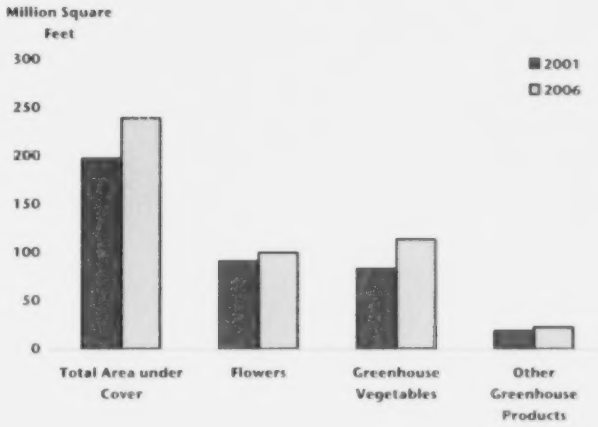
- **Between 2001 and 2006, greenhouse area in Canada increased by 21%.**

  For the first time, greenhouse vegetables surpassed greenhouse flowers as the main greenhouse product.

  As in other agricultural sectors, consolidation and expansion continued in the greenhouse industry. There were 5,600 operations in 2006, down 7% from 2001.

Chart A1.20

Greenhouse Area in Canada, 2001 and 2006



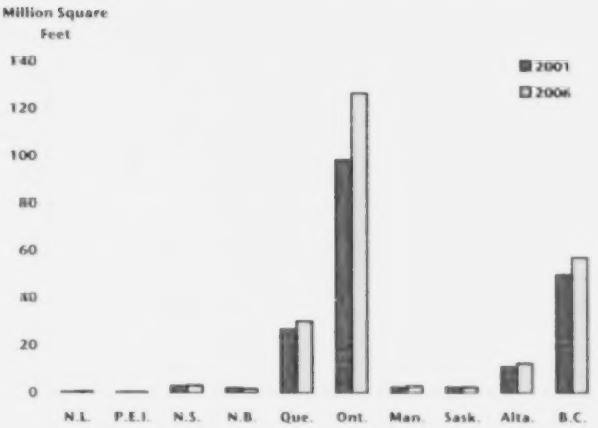
Source: Statistics Canada, 2001 and 2006 Censuses of Agriculture

- **Greenhouse area varies from province to province.**

  More than half (53%) of the total greenhouse area was in Ontario, with over 126 million square feet under cover in 2006 and a 29% increase between 2001 and 2006. British Columbia and Quebec had the second and third largest greenhouse area with 57 and 30 million square feet respectively.

Chart A1.21

Greenhouse Area by Province, 2001 and 2006



Source: Statistics Canada, 2001 and 2006 Censuses of Agriculture

A small but increasing number of farms are growing organic products

- **Over 15,000 farm operations (6.8%) reported at least one type of organic product in 2006.**

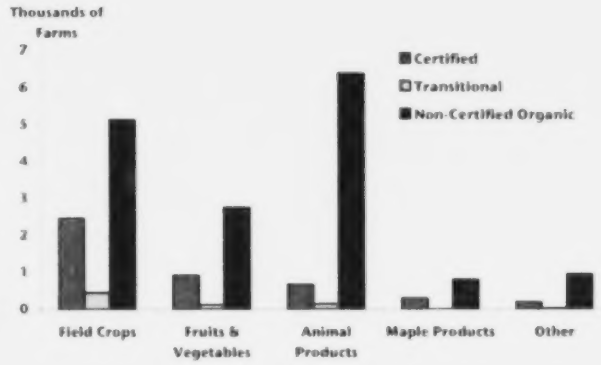
Non-certified organic production was by far the most common type reported. Farms that reported non-certified organic production were more likely to produce animal products. British Columbia led the way followed by Ontario.

The number of certified organic farms increased by 59% between 2001 and 2006.

Field crops were the predominant certified organic commodity with 2,462 operations reporting organic field crops in 2006. Half of these farms were located in Saskatchewan, followed by Ontario with 19% of farms.

Chart A1.22

Farms Reporting Organic Products by Type of Crop, 2006



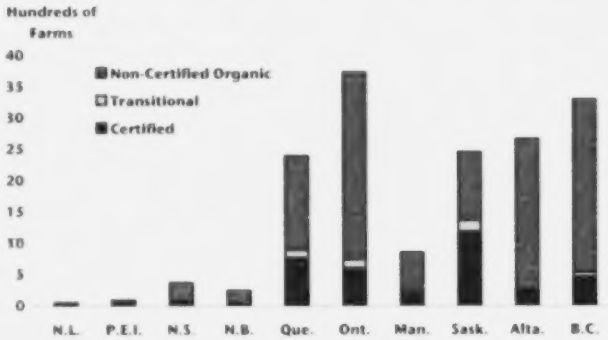
Source: Statistics Canada, 2006 Census of Agriculture.

- **Transitional organic production tends to be in field crops.**

Saskatchewan, with 38% of certified organic farms, outranked all other provinces in production in 2006.

Chart A1.23

Number of Farms with Organic Production by Province, 2006



Source: Statistics Canada, 2006 Census of Agriculture.

Note: Includes tame pasture (i.e. cultivated) and marginal pasture (i.e. non-cultivated).

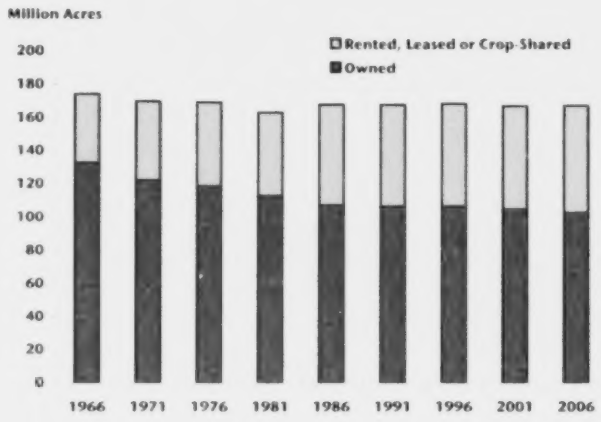
A larger share of land is rented by the farm operator

- **While land ownership remains attractive (61%), land rental offers a less-capital intensive means of expanding an operation.**

  Between 1966 and 2006, 22% of owned land moved to rented, leased or crop-shared land.

Chart A1.24

Land Tenure, Canada, 1968-2006

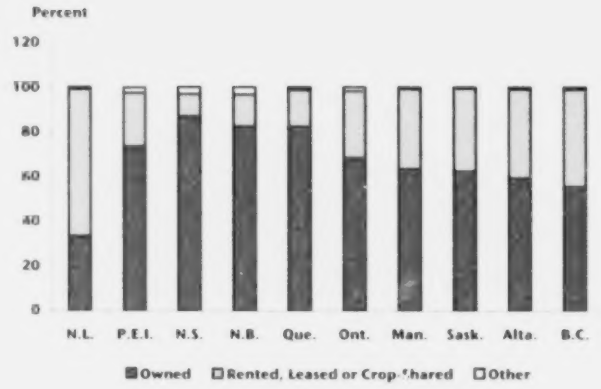


Source: Statistics Canada, Census of Agriculture, various years.

- **Newfoundland, British Columbia and Alberta had the lowest rates of ownership of land in Canada in 2006** at 33%, 55% and 59% of their total land respectively. New Brunswick, Nova Scotia and Quebec had the lowest rates of rented land area at 8%, 10% and 12% of their land respectively.

Chart A1.25

Land Tenure as Percent of Total Land by Province, 2006



Source: Statistics Canada, Census of Agriculture, various years.

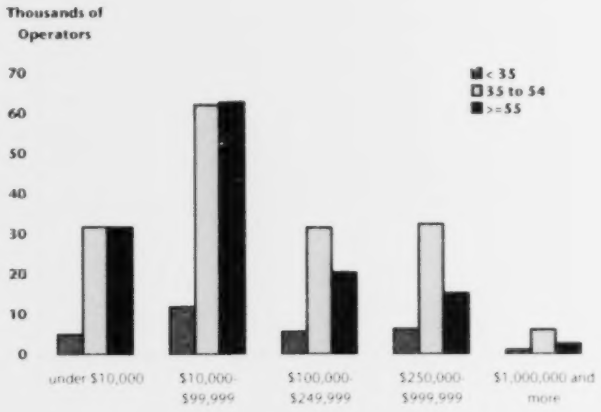
The age distribution of farm operators varies among farm sales class or size

- **The share of operators over the age of 54 has climbed, and now accounts for 40% of all operators in 2006.**

  Farms with sales under $100,000 had the lowest proportion of operators under the age of 35 in 2006.

  Farms with sales of $1,000,000 and over had the lowest proportion of operators over 55 with 27% aged between 35 and 54.

Chart A1.26
Age Class Distribution by Revenue Class, 2006

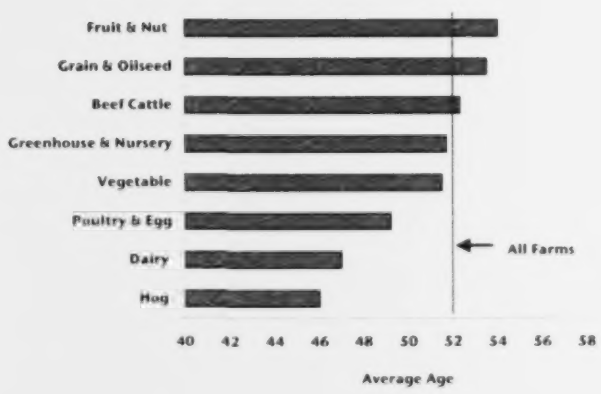


Source: Statistics Canada, 2006 Census of Agriculture

- **Hog and dairy farm operators are among the youngest in the agricultural sector at an average age of 46 and 47 years respectively.**

  Grain and oilseed and fruit and nut farm operators were on average, the oldest at 53 and 54 years of age in 2006.

Chart A1.27
Average Age of Operators by Farm Type, 2006



Source: Statistics Canada, 2006 Census of Agriculture

SECTION A2

New Industrial Uses of Agricultural Products

Canada has much to gain from the development of the bioeconomy. For agricultural producers, there are opportunities from the bioeconomy from increased demand for agricultural commodities as inputs into these bioproducts. The development of the bioeconomy is being driven by several factors including energy security, environmental concerns, health concerns and efforts to improve farm income and rural economic development. International policies promoting biofuel production, in particular, are having an impact around the world on both the price of commodities and the availability of renewable energy sources. The price of feedstocks such as corn, wheat and sugar has also risen due to this demand, and is having a significant impact on other agricultural sectors and the price of food.

The bioeconomy represents economic activity that uses renewable bioresources and bioprocesses to produce energy, industrial and functional foods and nutraceutical (FFN) products

- **The bioeconomy includes biofuels, biogas, bioplastics, biochemicals, biofibres, functional foods, biopharmaceuticals and nutraceuticals.**

Chart A2.1
Overview of the Bioeconomy and Bioresources

Energy Products
Ethanol[1]
Biodiesel[2]
Biogas
Others
Chemicals and medicinals
Nutraceuticals[3]
Functional Foods/Ingredients[4]
Biopharmaceuticals
Others
Biomaterials
Biofibres
Biochemicals
Bioplastics

Source: Various sources.

Note: 1. Agriculture and forestry related.
2. Agriculture, urban waste and marine related.
3. Agriculture, marine and forestry related.
4. Agriculture related.

- **The bioeconomy is growing in the global market.**

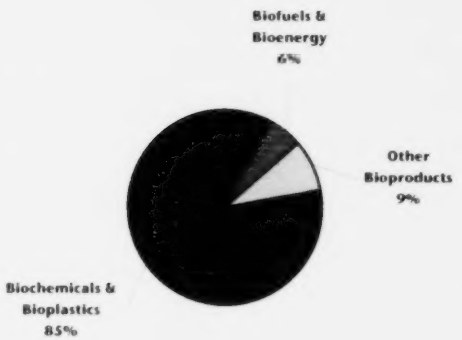
The global market for bioproducts in 2003 was valued at approximately $70 billion, of which 85% was for biochemicals and bioplastics.

However, the demand for biofuels and bioenergy has increased considerably in recent years.

It is estimated that the bioeconomy has the potential to be a $500 billion global market as early as 2015.

Biomass provides the feedstock for a biobased economy and a significant amount of biomass is provided by the agricultural sector.

Chart A2.2
Global Demand for Bioproducts, 2003



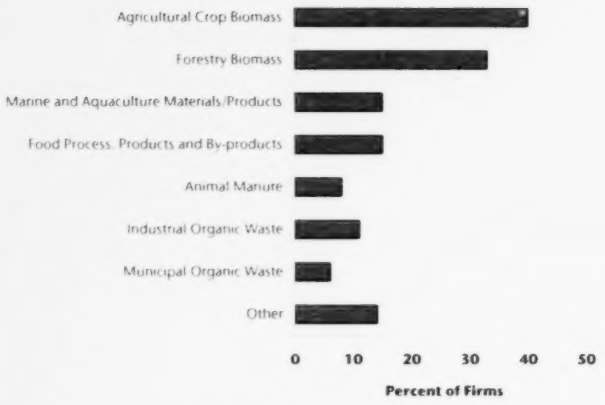
Source: The Bioeconomy: Positioning the Agriculture and Agri-Food Sector to Seize the Opportunities, 2007, AAFC.

Canada, as a large producer of biomass, may benefit from the development of the bioeconomy

- **The Canadian bioeconomy has several biomass sources.**

  Agriculture and forestry biomass are the most common inputs to bioproduct manufacturing. Over 40% of bioproduct firms made use of agricultural biomass while over 30% used forestry biomass.

Chart A2.3
Biomass Availability

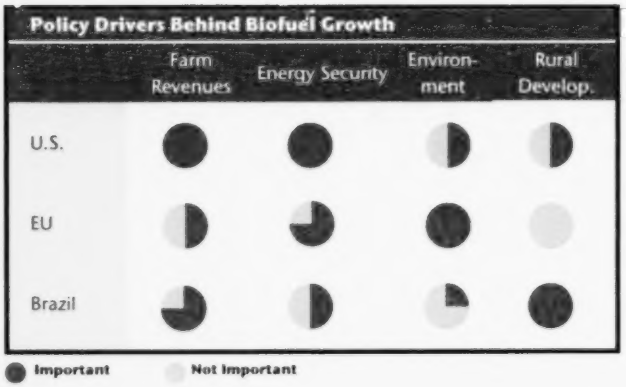


Source: Statistics Canada, Bioproduct Development Survey, 2003.
Note: Percents do not add up to 100% because a firm may use more than one type of biomass.

- **Globally, there are various reasons why countries are promoting the bioeconomy and biofuels in particular. The main drivers worldwide include energy security, the environment, rural development and farm revenues.**

  The weight of drivers in each country varies significantly. While the main driver in Europe is the environment, in the U.S., it is national energy security. Brazil has developed its ethanol industry to promote rural development and farm revenues.

Chart A2.4
Drivers of Biofuels



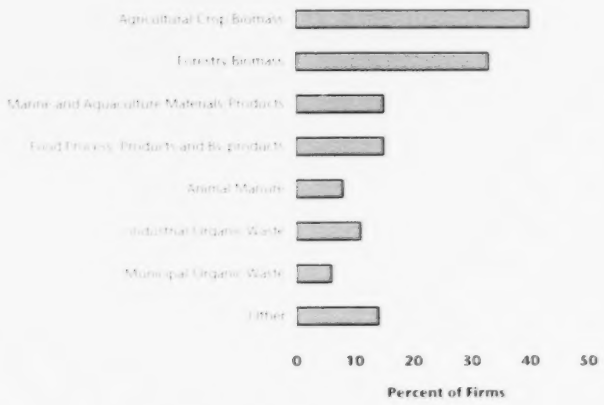
Source: Riese, J. Beyond the Hype – Growth in the Biofuels Industry, March 22, 2007.

Canada, as a large producer of biomass, may benefit from the development of the bioeconomy

- **The Canadian bioeconomy has several biomass sources.**

  Agriculture and forestry biomass are the most common inputs to bioproduct manufacturing. Over 40% of bioproduct firms made use of agricultural biomass while over 30% used forestry biomass.

Chart A2.3
Biomass Availability

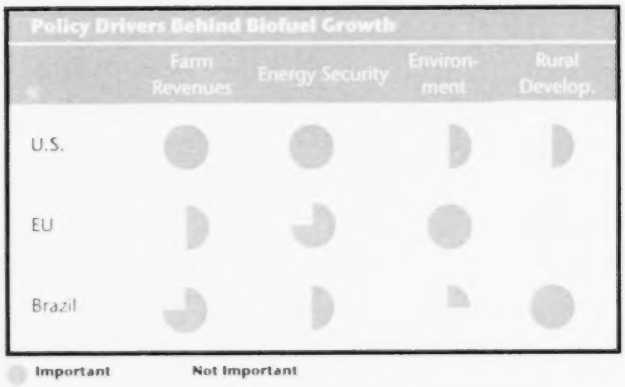


Source: Statistics Canada, Bioproduct Development Survey, 2015.
Note: Percents do not add up to 100% because a firm may generate more than one type of biomass.

- **Globally, there are various reasons why countries are promoting the bioeconomy and biofuels in particular. The main drivers worldwide include energy security, the environment, rural development and farm revenues.**

  The weight of drivers in each country varies significantly. While the main driver in Europe is the environment, in the U.S., it is national energy security. Brazil has developed its ethanol industry to promote rural development and farm revenues.

Chart A2.4
Drivers of Biofuels



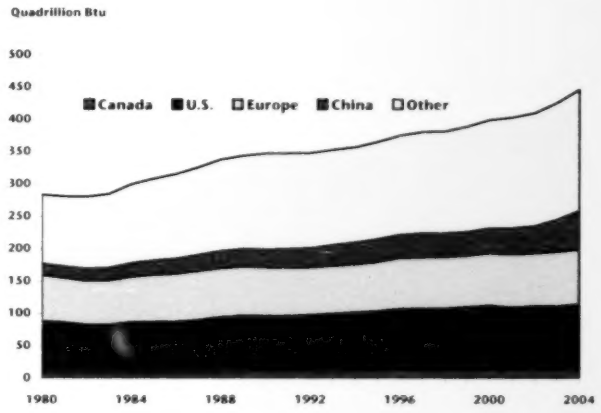
Source: Rose, J. Beyond the Hype – Growth in the Biofuels Industry, March 22, 2007.

Global developments such as rising demand for energy from emerging economies have led to higher oil prices

- **Crude oil prices have risen in response to increased demand for energy from emerging high growth economies, such as China. Political uncertainty in the Middle East, Africa and Venezuela, has also been a factor.**

  World oil consumption has more than doubled over the past two decades.

Chart A2.5
World Primary Energy Consumption, 1980-2004

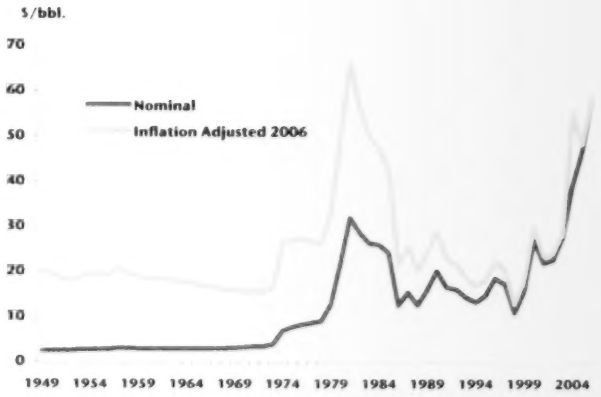


Source: Energy Information Administration, International Energy Annual Report 2004.

- **in 2006, crude oil prices were at their highest levels since the oil crisis in the early 1980s.**

  At current oil prices, biofuel technologies that were previously uneconomical, even with government support, are now feasible.

Chart A2.6
U.S. Annual Average Domestic Crude Oil Prices, 1949-2006



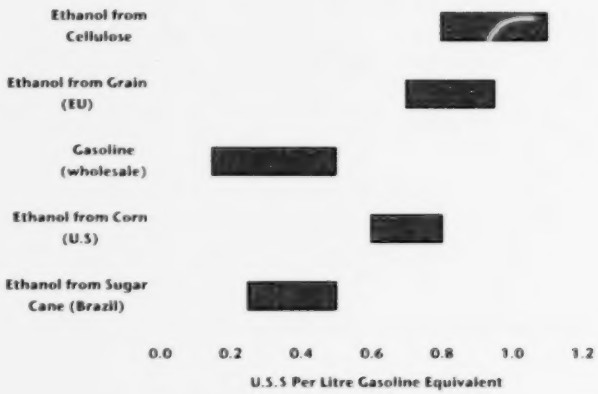
Source: USDOE, www.economagic.com and www.imperialoil.com.

The rising cost of crude oil and the availability of improved processing technologies have made biofuel production more economically feasible

- **Various renewable fuel types have differing costs of production that are a function of the technology and the cost of feedstock used.**

  When oil prices rise, the production of ethanol from corn or wheat becomes more competitive. For example, when the price of oil rises above U.S.$55 a barrel, ethanol can be produced economically from corn at a cost of $130/tonne without subsidy.

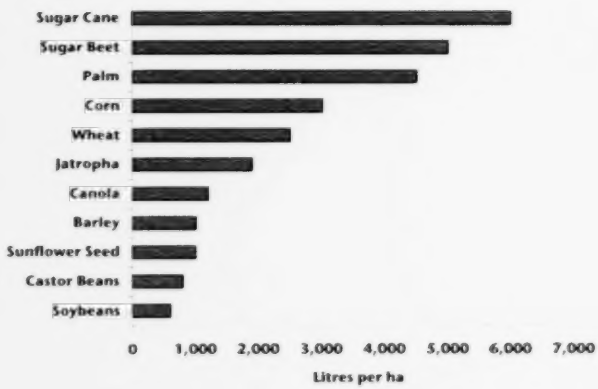
Chart A2.7
Cost of Production Ranges for Ethanol and Gasoline, 2005



Source: www.oecd.org
Note: Costs vary with oil price changes and are exclusive of government subsidies

- **Sugar cane is the most efficient agricultural feedstock for biofuel production, followed by sugar beet and corn.**

Chart A2.8
Biofuel Yields of Selected Ethanol and Biodiesel Feedstocks, 2006



Source: "Global Fuel Trends: Monthly Update, March 2006" available at www.earthtrends.com.

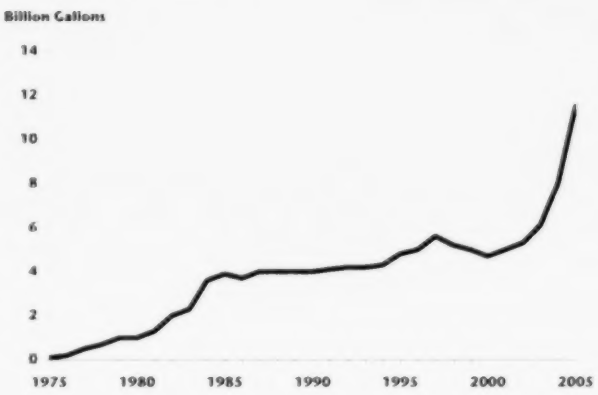
Rising biofuel production has led to increased demand for feedstocks and put pressure on grain prices

- **The production of biofuels worldwide increased from almost 5 billion gallons (17 million litres) in 2000 to over 11 billion gallons (47 million litres) in 2005.**

  Most of the increase in ethanol production has occurred in the U.S., where production now matches that of Brazil.

  Brazil makes ethanol from sugar cane and the U.S. from corn.

Chart A2.9
World Ethanol Production, 1975-2005



Source: www.earthtrends.com

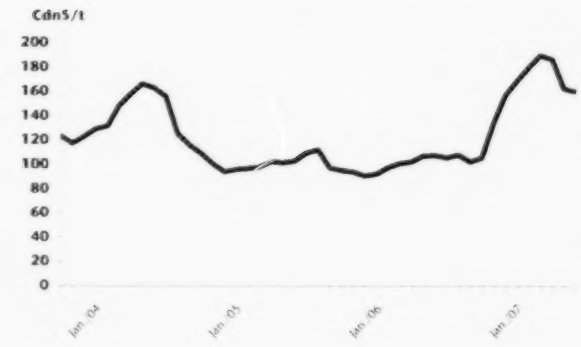
- **The bioeconomy can be an alternative source of income for farmers.**

  Increased demand for existing and new agricultural commodities for non-food, non-feed industrial uses can lead to increased farm revenues from greater volumes sold and higher commodity prices.

  The recent trends in U.S. corn price is an example of the response to increased corn demand for biofuel production.

  However, rising corn prices may have a negative impact on livestock producers who use grains as input.

Chart A2.10
U.S. Corn Price, Sept. 2003 - May 2007



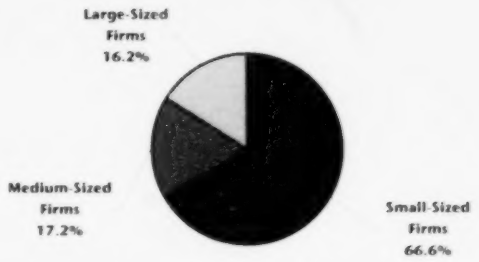
Source: USDA, ERS AutoFAX 12005 - AMS, Grain and Feed Market News.
Prepared by AAFC.

Innovative bioproducts may also provide an excellent market opportunity for effective diversification in managing competitive global pressures for processors

- **Several Canadian firms are developing bioproducts.** According to the Bioproduct Development Survey in 2003, there were 232 firms across Canada developing bioproducts and employing nearly 7,800 people in bioproduct development.

  About 67% of these firms were small, with fewer than 50 employees.

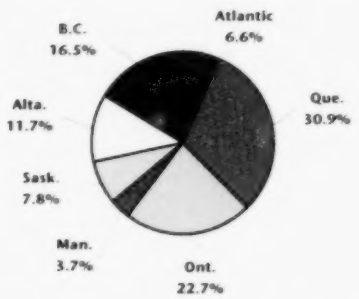
Chart A2.11
Bioproduct Firms by Size, 2003



Source: Statistics Canada, Bioproduct Development Survey, 2003.
Note: Large-sized firms are those with 150 or more employees, medium-sized are those with 50-149 employees and small-sized are those with less than 50 employees.

- **About 50% of bioproduct firms were located in Quebec and Ontario and 23% in the prairie provinces.**

Chart A2.12
Bioproduct Firms by Province, 2003



Source: Statistics Canada, Bioproduct Development Survey, 2003.

- **International market opportunities are the key to future bioproduct development.**

  Almost half (46%) of bioproduct revenues were derived from exports in 2003.

Chart A2.13
Export Revenues of Bioproduct Firms, 2003

Firm Size	Revenues from Bioproducts, Per Firm	Revenues from Bioproducts Exported, Per Firm	
	($000)	($000)	Percent
Small (Less than 50 Employees)	2,608	1,589	61
Medium (50-149 Employees)	27,407	14,415	53
Large (More than 149 Employees)	45,105	18,486	41
Total	**13,489**	**6,429**	**46**

Source: Statistics Canada, Bioproduct Development Survey, 2003.

Various bioproducts such as bioplastics, biochemicals, biofibres, other biomaterials, and FFN are being produced in Canada

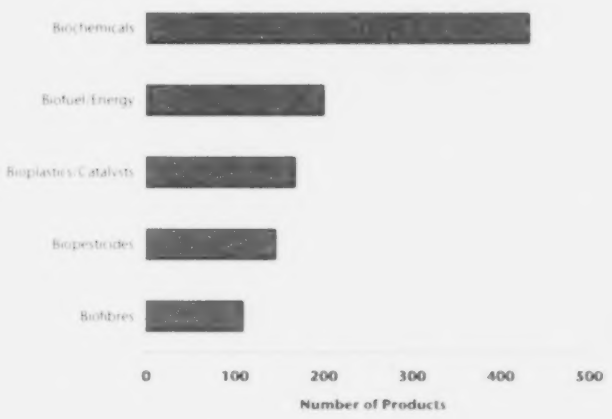
- **Over 1,000 bioproducts were produced or developed in Canada in 2003.**

The bulk of them were in the biochemical industry followed by biofuels and bioplastics.

As an example, over 400 products such as inks, solvents, lubricants, disinfectants and adhesives were produced in the biochemical industry in 2003.

Chart A2.14

Number of Products by Bioproduct Category, 2003



Source: Statistics Canada, Bioproduct Development Survey, 2003

- **The number of FFN firms in Canada has been increasing.**

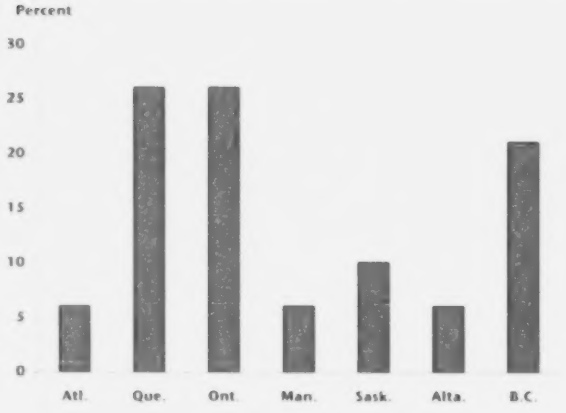
In 2004, there were 389 firms engaged in FFN activities, an increase of 2% from 2002. Most of these firms were in Quebec, Ontario and British Columbia.

About 45% of all FFN firms were solely in the nutraceuticals business.

FFN firms reported revenues of $2.9 billion from functional foods and nutraceuticals in 2004.

Chart A2.15

Functional Food and Nutraceutical Firms in Canada, 2004



Source: Statistics Canada, 2004 FFN Survey

Bioproduct and FFN development requires innovative technologies and R&D

- **Bioproduct firms allocated only 3% of bioproduct revenues to research and development (R&D), compared to 10% by other emerging science-based industries.**

Bioproduct firms in Alberta, Quebec and Manitoba spent more on R&D than firms in other provinces.

Bioproduct firms in Quebec and Manitoba spent, on average, 5.2% and 4.5% of bioproduct revenues respectively on R&D.

Similarly FFN firms allocated 3% of revenues to R&D.

Chart A2.16
R&D Spending by Bioproduct Firms, by Province

Region	Average Total R&D Per Firm	Average Bioproduct R&D Per Firm	Bioproduct R&D/Bioproduct Revenue
Atlantic	$288,251	$33,019	
Quebec	$1,326,609	$571,543	5.2%
Ontario	$673,718	$309,468	1.9%
Manitoba	$1,389,441	$640,525	4.5%
Saskatchewan	$562,151	$205,875	1.7%
Alberta	$1,911,127	$526,447	2.1%
British Columbia	$716,090	$309,599	1.9%
CANADA	$1,032,509	$403,006	3.0%

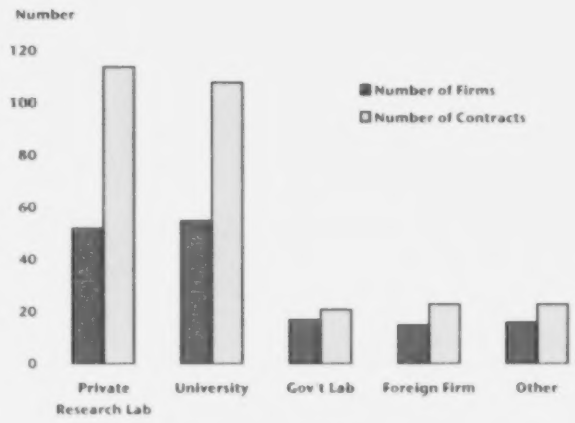
Source: Statistics Canada, Bioproduct Development Survey, 2003

- **In addition to undertaking their own R&D, bioproduct and FFN firms used other strategies to acquire new knowledge and technologies in the development of bioproducts and FFN.**

For example, 36% of all Canadian bioproduct firms contracted out R&D activities, especially to private research laboratories and universities in 2003.

About 35% of bioproduct firms collaborated with non-bioproduct firms and academic institutions not only for R&D, but also for marketing in 2003.

Chart A2.17
External Contracting by Bioproduct Firms, 2003



Source: Statistics Canada, Bioproduct Development Survey, 2003

Bioproduct and FFN development requires innovative technologies and R&D

- **Bioproduct firms allocated only 3% of bioproduct revenues to research and development (R&D), compared to 10% by other emerging science-based industries.**

  Bioproduct firms in Alberta, Quebec and Manitoba spent more on R&D than firms in other provinces.

  Bioproduct firms in Quebec and Manitoba spent, on average, 5.2% and 4.5% of bioproduct revenues respectively on R&D.

  Similarly FFN firms allocated 3% of revenues to R&D.

Chart A2.16
R&D Spending by Bioproduct Firms, by Province

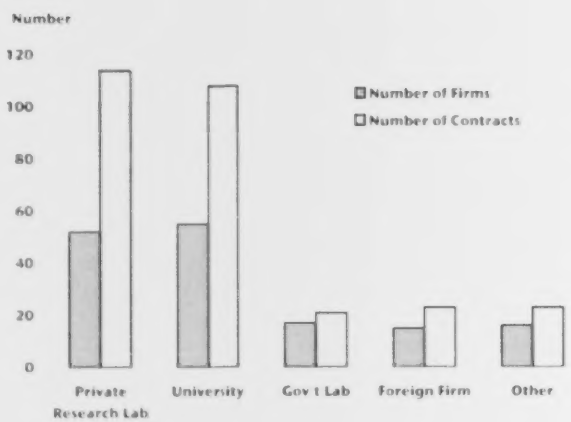
Region	Average Total R&D Per Firm	Average Bioproduct R&D Per Firm	Bioproduct R&D/Bioproduct Revenue
Atlantic			
Quebec			
Ontario			
Manitoba			
Saskatchewan			
Alberta			
British Columbia			
CANADA	$1,032,509	$403,006	3.0%

- **In addition to undertaking their own R&D, bioproduct and FFN firms used other strategies to acquire new knowledge and technologies in the development of bioproducts and FFN.**

  For example, 36% of all Canadian bioproduct firms contracted out R&D activities, especially to private research laboratories and universities in 2003.

  About 35% of bioproduct firms collaborated with non-bioproduct firms and academic institutions not only for R&D, but also for marketing in 2003.

Chart A2.17
External Contracting by Bioproduct Firms, 2003



Bioproduct and FFN firms, like most innovative firms, face impediments to development and production

- **Bioproduct firms identified lack of financial capital and high costs and timeliness of regulations as major impediments to bioproduct development in Canada.**

  Unreliable supply of materials/feedstocks and the high price of feedstocks are the next two most important impediments to bioproduct development.

Chart A2.18

Impediments to Development, 2003

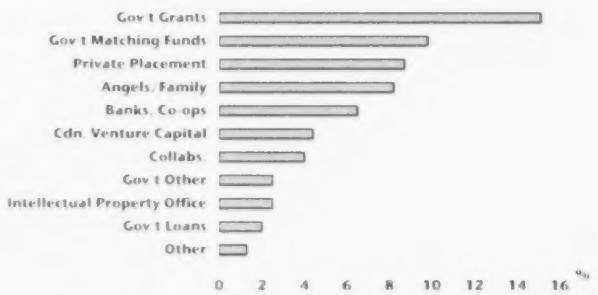
Barriers to Bioproduct Development and Commercialization	% of Firms Indicating Medium or High Importance
Lack of Financial Capital	50.9
Higher Cost and Timeliness of Regulatory Approval	48.9
Unreliable Supply of Materials/Feedstocks	33.7
Higher Price of Raw Materials/Feedstocks	34.8
Higher Transportation Cost of Main Feedstock/Raw Material	32.2
Lack of Adequate Product Standard Certification	30.1
Lack of Technology/Technical Information	29.1
Lack of Skilled Human Resources	25.3
Difficulty to Substitute/Integrate into Existing Process	19.9
Negative Public Perception/Acceptance	14.9
Restriction on Intellectual Property (IP) Rights	9.6

Source: Statistics Canada, Bioproduct Development Survey, 2003

- **In order to address lack of finance, the government offers various grants and matching funds to bioproduct firms.** Other sources of financial capital accessed by bioproduct firms are venture capital banks and angel investors.

Chart A2.19

Sources of Capital for Bioproduct Firms, 2003



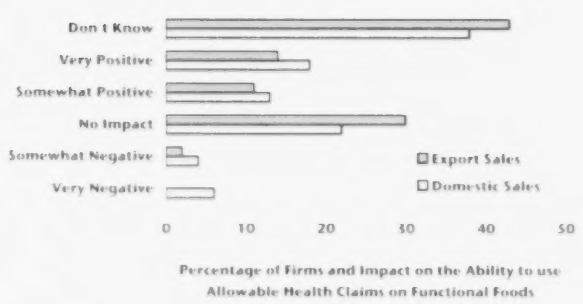
Source: Statistics Canada, Bioproduct Development Survey, 2003

- **One-third of firms producing functional foods believe that sales will be positively impacted by their ability to use allowable health claims.**

  The development of export markets for bioproducts and functional foods are also hampered by the lack of international standards or harmonization with any standards that exist.

Chart A2.20

Importance of Health Claims for FFN Firms, 2004



Source: Statistics Canada, 2004 FFN Survey

Bioproduct and FFN firms, like most innovative firms, face impediments to development and production

- **Bioproduct firms identified lack of financial capital and high costs and timeliness of regulations as major impediments to bioproduct development in Canada.**

  Unreliable supply of materials/feedstocks and the high price of feedstocks are the next two most important impediments to bioproduct development.

Chart A2.18

Impediments to Development, 2003

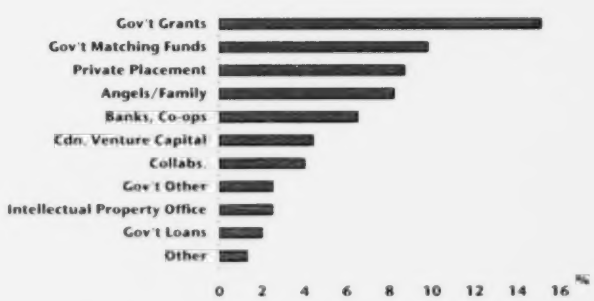
Barriers to Bioproduct Development and Commercialization	% of Firms Indicating Medium or High Importance
Lack of Financial Capital	50.9
Higher Cost and Timeliness of Regulatory Approval	48.9
Unreliable Supply of Materials/Feedstocks	35.7
Higher Price of Raw Materials/Feedstocks	34.8
Higher Transportation Cost of Main Feedstock/Raw Material	32.2
Lack of Adequate Product Standard/Certification	30.3
Lack of Technology/Technical Information	28.3
Lack of Skilled Human Resources	25.7
Difficulty to Substitute/Integrate into Existing Process	19.9
Negative Public Perception/Acceptance	14.9
Restriction on Intellectual Property (IP) Rights	9.6

Source: Statistics Canada, Bioproduct Development Survey, 2003

- **In order to address lack of finance, the government offers various grants and matching funds to bioproduct firms.** Other sources of financial capital accessed by bioproduct firms are venture capital banks and angel investors.

Chart A2.19

Sources of Capital for Bioproduct Firms, 2003



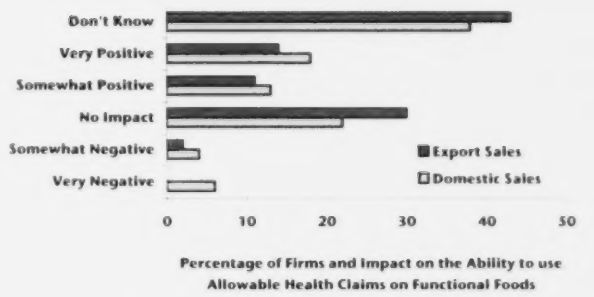
Source: Statistics Canada, Bioproduct Development Survey, 2003

- **One-third of firms producing functional foods believe that sales will be positively impacted by their ability to use allowable health claims.**

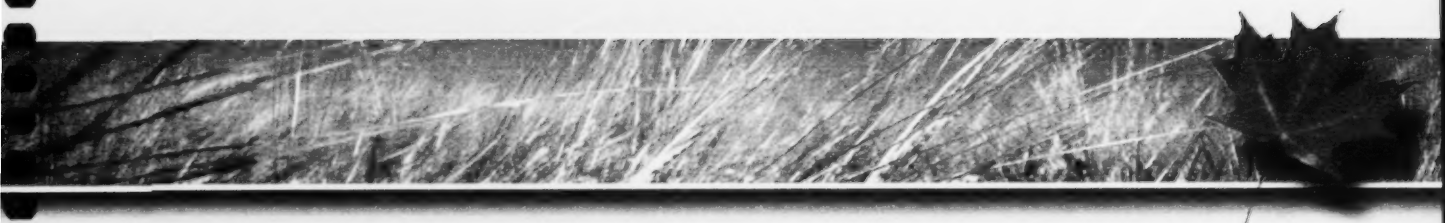
  The development of export markets for bioproducts and functional foods are also hampered by the lack of international standards or harmonization with any standards that exist.

Chart A2.20

Importance of Health Claims for FFN Firms, 2004



Source: Statistics Canada, 2004 FFN Survey



SECTION B

The Agriculture and Agri-Food System and the Canadian Economy

SECTION B1

GDP and Employment

The Canadian agriculture and agri-food system is a complex and integrated supply chain of importance to the Canadian economy. It makes significant direct and indirect contributions to the Canadian Gross Domestic Product (GDP) and employment, and its importance varies from province to province.

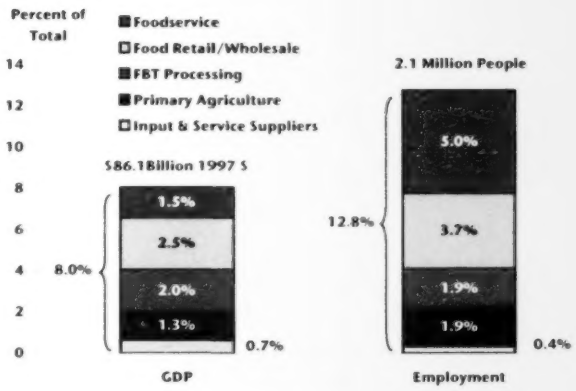
The agriculture and agri-food system plays a significant role in the Canadian economy

- **The Canadian agriculture and agri-food system accounted for 8.0% of total Canadian Gross Domestic Product (GDP) in 2005.**

  The system provides one in eight jobs, and employs nearly 2.1 million people. The system also indirectly generates additional GDP and employment in other economic sectors.

Chart B1.1

The Agriculture and Agri-Food System's Contribution to GDP and Employment, 2005



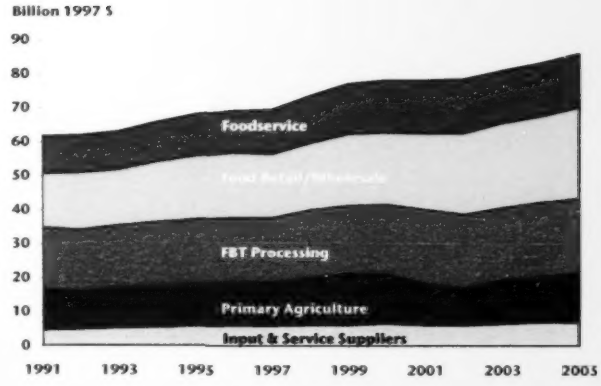
Source: Statistics Canada and AAFC calculations.

- **Since 1991, the overall agricultural and agri-food system has been growing at an average of 2.4% per annum, which is below the average annual growth rate of the overall economy.**

  Value-added production is leading the growth of the system. It includes food, beverage and tobacco (FBT) processing, and food retail/wholesale and foodservice. Food retail/wholesale is the fastest growing component with an average annual growth rate of 3.8%. Input and service suppliers also have an average annual growth rate of 3%.

Chart B1.2

The Agriculture and Agri-Food System's Contribution to GDP, 1991-2005



Source: Statistics Canada and AAFC calculations.

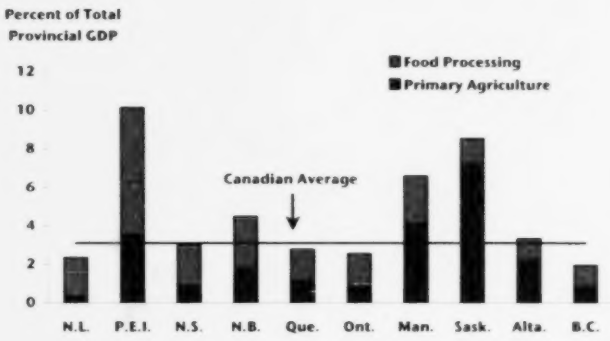
The agriculture and agri-food sector is an important source of income for provincial economies

- **In terms of contribution to total provincial GDP, agriculture and food processing plays the largest role in Prince Edward Island, accounting for over 10% of provincial GDP, while in Saskatchewan and Manitoba, it represents 7% of provincial GDP.**

  The mix between primary agriculture and food processing also varies across the country. East of Manitoba, food processing accounts for the majority of the agriculture and agri-food sector's share of provincial GDP. In the Prairies, primary agriculture plays a more important role.

Chart B1.3

The Agriculture and Agri-Food Sector's Contribution to Provincial GDP, 2005



Source: Statistics Canada.

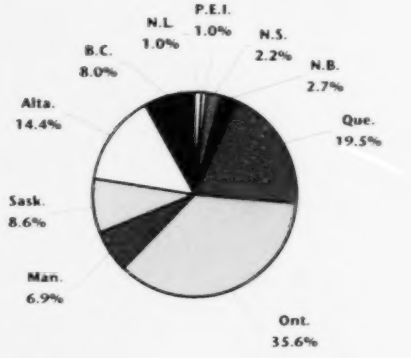
Note: Excludes beverages and tobacco processing.

- **The contribution by each province to the agriculture and agri-food sector GDP varies across Canada.**

  In 2005, Ontario, Quebec and Alberta accounted for around 70% of the total Canadian agriculture and agri-food GDP.

Chart B1.4

The Provincial Contribution to Canadian Agriculture and Agri-Food Sector GDP, 2005



Source: Statistics Canada.

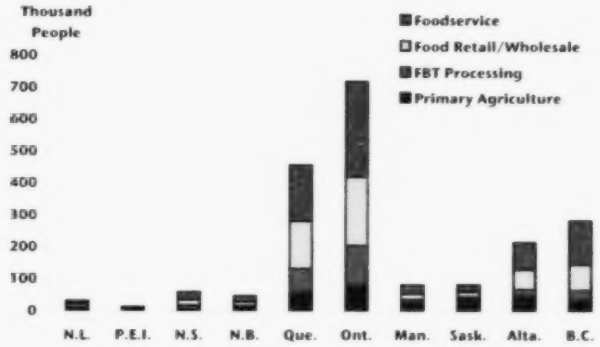
Note: Excludes beverages and tobacco processing.

The agriculture and agri-food system is also a major employer in provincial economies

- **Ontario and Quebec have the most people employed in the agriculture and agri-food system, accounting for just under 50% of total Canadian agriculture and agri-food system's employment.**

Chart B1.5

Provincial Employment in the Agriculture and Agri-Food System, 2005



Source: Statistics Canada and AAFC calculations.

Note: Provincial input & service suppliers have been excluded because of reliability and confidentiality data concerns with many of its component industries.

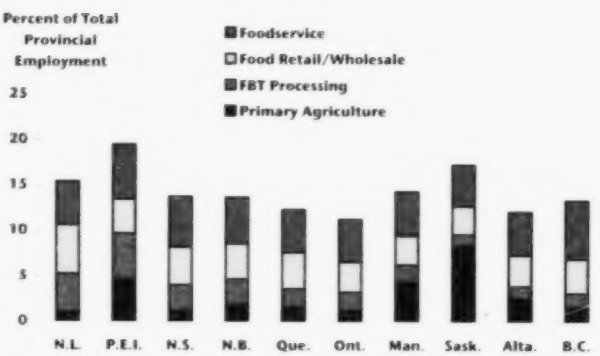
- **The system accounts for the largest shares of provincial employment in Prince Edward Island and Saskatchewan.**

However, in most provinces, employment in retail and wholesale accounts for the largest share of total employment in the agriculture and agri-food system.

More than 50% of the total agriculture and agri-food system's employment in Prince Edward Island and Saskatchewan is accounted for by the primary agriculture and FBT processing sectors.

Chart B1.6

The Agriculture and Agri-Food System's Share of Provincial Employment, 2005



Source: Statistics Canada and AAFC calculations.

Note: Provincial input & service suppliers have been excluded because of reliability and confidentiality data concerns with many of its component industries.

Given the importance of the agriculture and agri-food system for the Canadian economy, any increase in production leads to increases in overall GDP and employment

- **Growth in the agriculture and agri-food sector impacts the rest of the Canadian economy as well.**

  For example, for every $1 of direct GDP created in primary agriculture, an additional $1.8 of GDP is indirectly created, and for every job created another 0.91 indirect jobs are created in the economy.

  For every $1 of direct GDP created in the food processing industry, an additional $1.81 of GDP is indirectly created in the economy. Similarly for every job created by this activity, another 2.55 jobs are indirectly created.

Chart B1.7

Economy Multipliers for the Agriculture and Agri-Food Sector

For every $1 of GDP created in:	Impacts on GDP and Employment	
Industry/Commodity	Ratio of Total-To-Direct GDP	Ratio of Total-To-Direct Employment
Primary Agriculture	2.80	1.91
Total Food Processing	2.81	3.55
- Sausages	2.80	3.24
- Pork (fresh or chilled)	2.17	2.01
- Potatoes (fresh or chilled)	1.69	1.40

Source: Statistics Canada Input/Output Model, 2003.

SECTION B2

International Trade and Global Developments

The success of the agriculture and agri-food sector depends on trade as Canada's domestic market is relatively small. During the last 15 years, Canada has increased its share of world agri-food trade in response to trade liberalization and changing market conditions by producing increasingly value-added goods that meet changing consumer and market demands. The recent appreciation of the Canadian dollar has led to challenges for the sector, such as declining export demand, rising relative labour costs and increased competition from emerging economies.

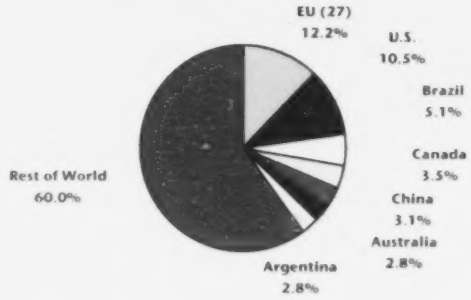
Canada is a major player in world agri-food trade

- **Canada is the fourth largest agriculture and agri-food exporter,** after the EU(27), the U.S. and Brazil.

  Canada accounts for 3.5% of total world agriculture and agri-food exports.

Chart B2.1

World Agricultural and Agri-food Export Share by Country of Origin, 2006



Source: Global Trade Atlas and AAFC calculations.

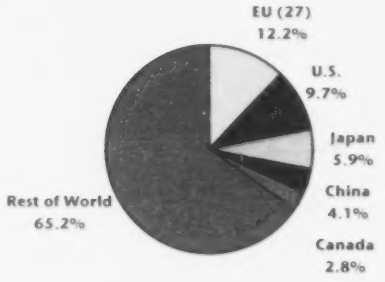
Note: Excludes EU (27) intra-regional trade.

- **Canada is the fifth largest agriculture and agri-food importer,** after the EU(27), the U.S., Japan and China.

  Canada accounts for 2.8% of world agriculture and agri-food imports.

Chart B2.2

World Agricultural and Agri-food Import Share by Country of Destination, 2006



Source: Global Trade Atlas and AAFC calculations.

Note: Excludes EU (27) intra-regional trade.

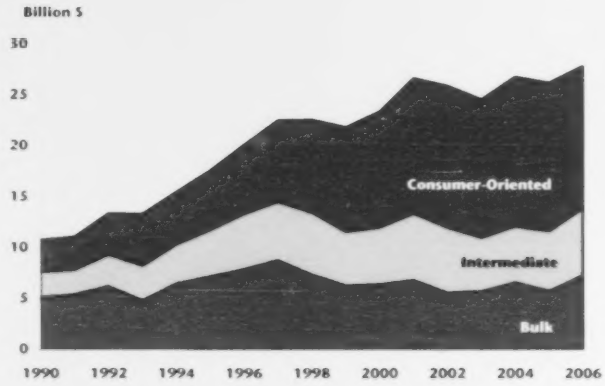
Trade growth has been driven by growth in value-added and consumer-oriented exports

- **The export value of consumer-oriented products has more than quadrupled since 1990, and now makes up more than one-half of all export sales.**

  In 2006, total Canadian export sales were $28 billion, surpassing the previous record peak in 2004.

Chart B2.3

Canadian Agriculture and Agri-Food Export Sales (BICO), 1990-2006



Source: Statistics Canada and AAFC calculations

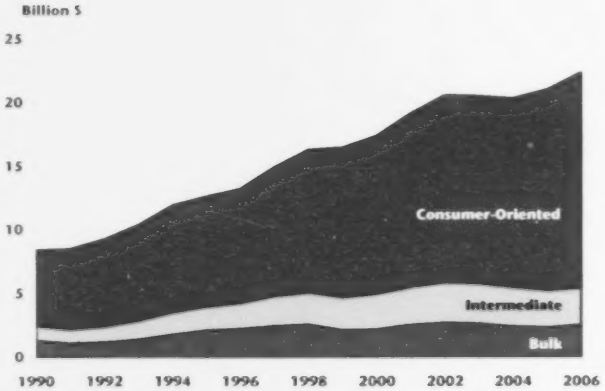
- **Consumer-oriented products also make up the majority of Canadian agriculture and agri-food imports,** accounting for 75% of the total in 2006.

  Consumer-oriented products have roughly maintained a 70% share over the last decade.

  In 2006, total Canadian import sales reached a high of $22.4 billion.

Chart B2.4

Canadian Agriculture and Agri-Food Import Sales (BICO), 1990-2006



Source: Statistics Canada and AAFC calculations

The recent appreciation of the Canadian dollar has affected value-added exports

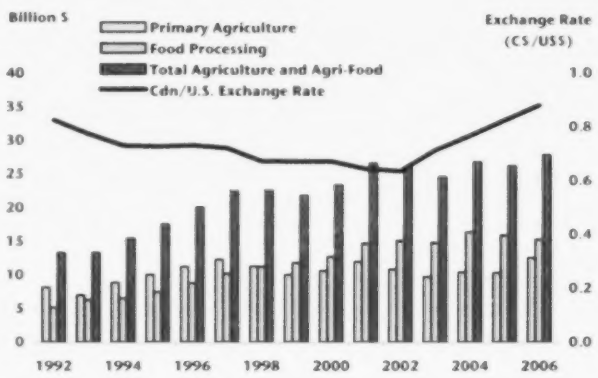
- **The Canadian dollar has appreciated by about 40% over the past five years.**

  In 2000, the Canadian dollar was worth an average US$0.67, while in 2006, the Canadian dollar rose to US$0.88. It has since become stronger than the US dollar as of October 2007.

  Value-added exports flattened while exports of primary agricultural products increased during this period of currency appreciation, between 2003 and 2006.

Chart B2.5

Exchange Rate Appreciation and Agriculture and Agri-Food Exports, 1992-2006



Source: Statistics Canada and AAFC calculations

The commodity composition of trade has changed over time

- **The composition of Canadian export sales has changed over time.**

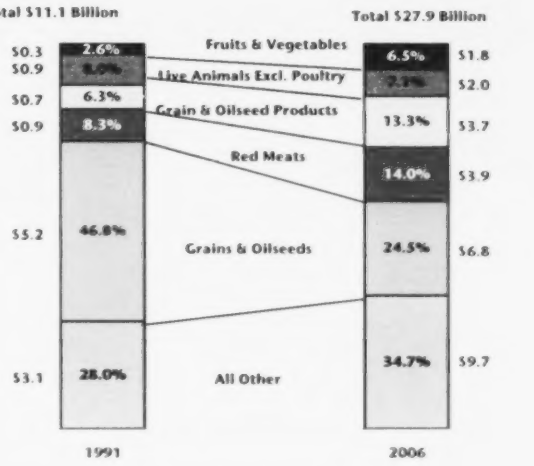
  Grains and oilseeds and their products accounted for over one-quarter of the total value of agriculture and agri-food exports in 2006, down from about one-half in 1991.

  Most of the decline has been due to the decline in wheat exports.

  Live animals and red meats have increased in importance and accounted for 21% of the sector's export sales in 2006, up from only 16% in 1991.

Chart B2.6

Commodity Composition of Export Sales, 1991 and 2006



Source: Statistics Canada and AAFC calculations

- **The commodity mix of imports has also changed.**

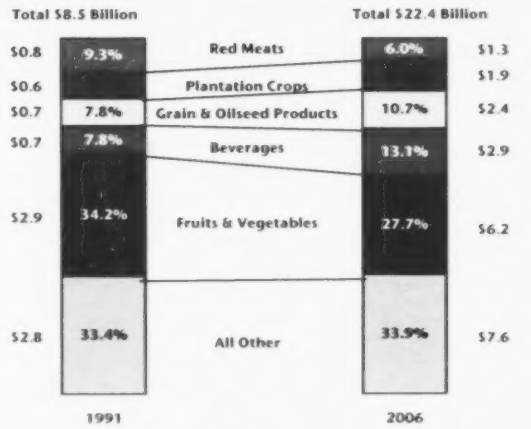
  For example, while wheat and barley make up the bulk of Canadian grain exports, rice and corn comprise most Canadian grain imports.

  The most important category of imports in 2006 was fruits and vegetables, with over a 27% value share. This was down from its 34% share in 1991.

  Whereas the red meat share of exports has increased, its import share has declined.

Chart B2.7

Commodity Composition of Import Sales, 1991 and 2006



Source: Statistics Canada and AAFC calculations

The commodity composition of trade has changed over time

- **The composition of Canadian export sales has changed over time.**

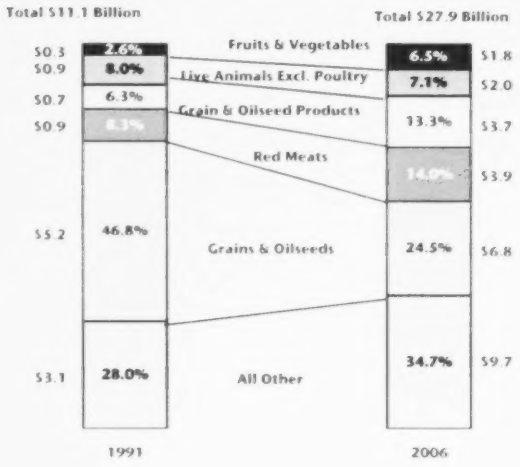
Grains and oilseeds and their products accounted for over one-quarter of the total value of agriculture and agri-food exports in 2006, down from about one-half in 1991.

Most of the decline has been due to the decline in wheat exports.

Live animals and red meats have increased in importance and accounted for 21% of the sector's export sales in 2006, up from only 16% in 1991.

Chart B2.6

Commodity Composition of Export Sales, 1991 and 2006



Source: Statistics Canada and AAFC calculations

- **The commodity mix of imports has also changed.**

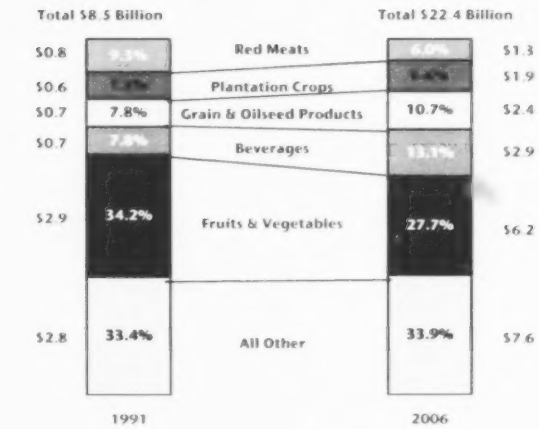
For example, while wheat and barley make up the bulk of Canadian grain exports, rice and corn comprise most Canadian grain imports.

The most important category of imports in 2006 was fruits and vegetables, with over a 27% value share. This was down from its 34% share in 1991.

Whereas the red meat share of exports has increased, its import share has declined.

Chart B2.7

Commodity Composition of Import Sales, 1991 and 2006



Source: Statistics Canada and AAFC calculations

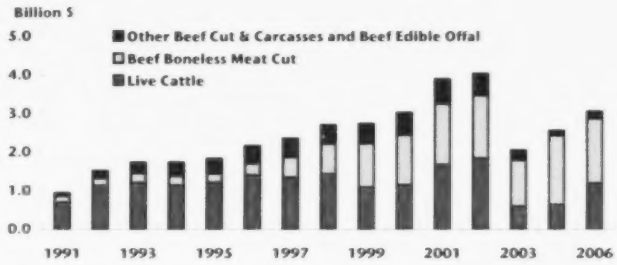
Cattle and beef export sales have recovered slightly since 2003, while hog and pork exports are slowing

- **In July 2005, the U.S. border was reopened to live cattle and bison less than 30 months old, increasing export sales. Since then, other countries, such as New Zealand and Japan have reopened their borders to Canadian beef.**

  These changes have led to an increase in cattle and beef exports from about $2 billion in 2003 to about $3 billion in 2006.

Chart B2.8

Export Sales of Live Cattle and Beef, 1991-2006



Source: Statistics Canada and AAFC calculations.

- **Export sales of live hogs and pork have declined from about $3.3 billion in 2004 to $3.1 billion in 2006.**

Chart B2.9

Export Sales of Live Hogs and Pork, 1990-2006

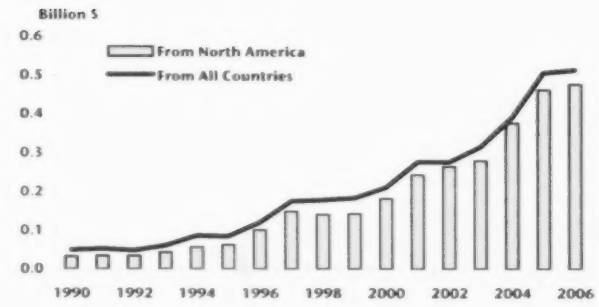
Source: Statistics Canada and AAFC calculations.

- **Imports of live hogs and pork have also slowed down.**

  Imports of live hogs and pork increased significantly from $51 million in 1990 to just over $500 million in 2005 but have flattened out in recent years.

Chart B2.10

Import Sales of Live Hogs and Pork, 1990-2006



Source: Statistics Canada and AAFC calculations.

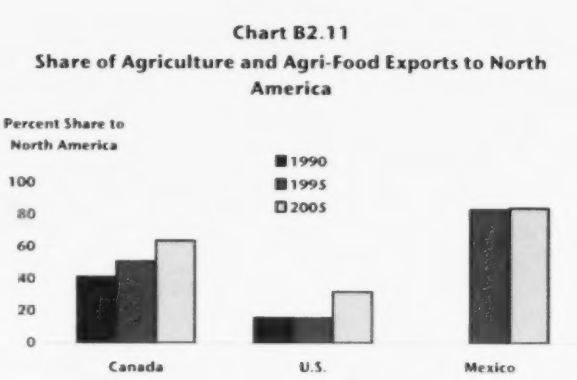
Agriculture and agri-food trade is increasingly integrated within the North American market

- **The North American market is becoming increasingly integrated,** resulting in a higher intensity of Canadian-U.S.-Mexican agri-food trade.

  Canada and Mexico are more dependent on NAFTA trade of agriculture and food processed products than the U.S.

Chart B2.11

Share of Agriculture and Agri-Food Exports to North America

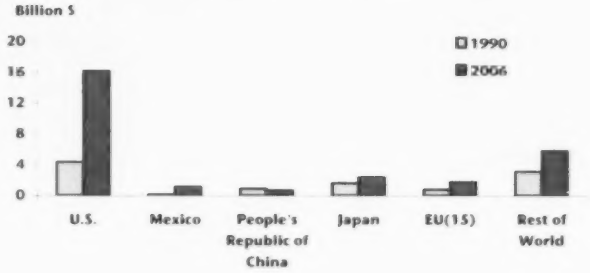


Source: Statistics Canada, Industry Canada, Global Trade Atlas and AAFC calculations.
Note: 1990 data for Mexico is unavailable.

- Canadian agriculture and agri-food export sales to the U.S. have quadrupled since 1990, while those to Mexico have increased ninefold.

Chart B2.12

Value of Canadian Agriculture and Agri-Food Exports by Country of Destination, 1990 and 2006

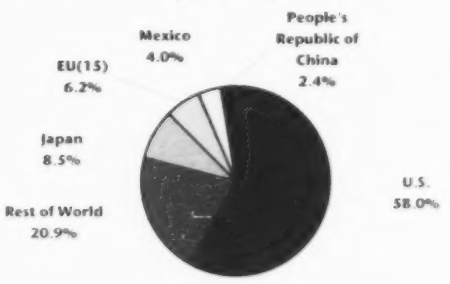


Source: Statistics Canada and AAFC calculations.

- **In 2006, the U.S. accounted for 58% of Canada's total agriculture and agri-food export sales** in comparison to a 40% share in 1990.

Chart B2.13

Destinations of Canadian Agriculture and Agri-Food Exports, 2006



Source: Statistics Canada and AAFC calculations.

Trade with the rest of the world is holding steady

- **Agriculture and agri-food exports to countries outside North America have fluctuated between $8 billion and $9 billion since 1995.**

  Exports to the rest of the world accounted for 38% in 2006 compared to about 60% in 1990.

  Japan is the largest purchaser of Canadian agriculture and agri-food products behind the U.S., which accounted for 8.5% and the EU(15) 6.2% (see Chart B2.13).

Chart B2.14

Agriculture and Agri-Food Exports to North America and Rest of World, 1990-2006

Source: Statistics Canada and AAFC calculations.

- **Imports from countries other than the U.S. and Mexico have more than doubled since 1990, while imports from NAFTA countries have nearly tripled.**

Chart B2.15

Agriculture and Agri-Food Imports from North America and Rest of World, 1990-2006

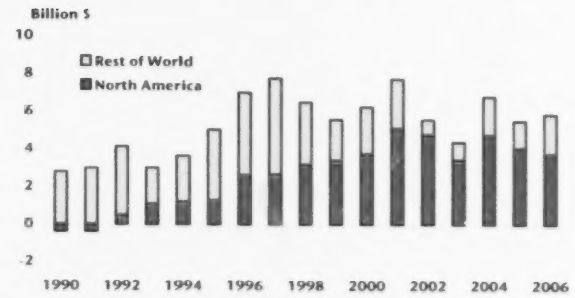
Source: Statistics Canada and AAFC calculations.

- **Agriculture and agri-food imports have been growing at a slower pace than exports, resulting in a widening positive trade balance.** In 2006, the overall trade surplus increased by 6.2% to $5.8 billion.

  The trade balance with North America increased in the 1990s and early 2000s, but has narrowed over the past three years while the trade balance with the rest of the world has fluctuated during the same period.

Chart B2.16

Agriculture and Agri-Food Trade Balance with North America and Rest of World, 1990-2006



Source: Statistics Canada and AAFC calculations.

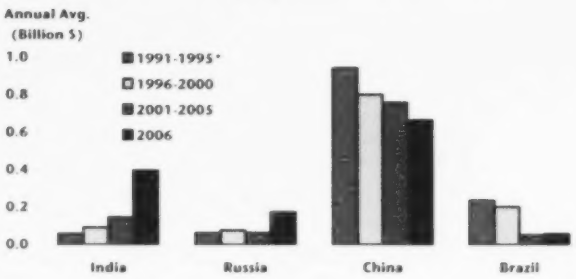
The emergence of powerhouse economies such as India with growing middle-income consumers bodes well for future trade opportunities for the Canadian agriculture and agri-food sector

- **Canadian agriculture and agri-food exports to India and other developing economies have increased since the early 1990s.**

  Canadian agriculture and agri-food exports to India increased from $60 million in the early 1990s to $398 million in 2006. This has more than offset the decline in exports to China.

Chart B2.17

Canadian Value of Agriculture and Agri-Food Exports to Emerging Countries, 1991-2006



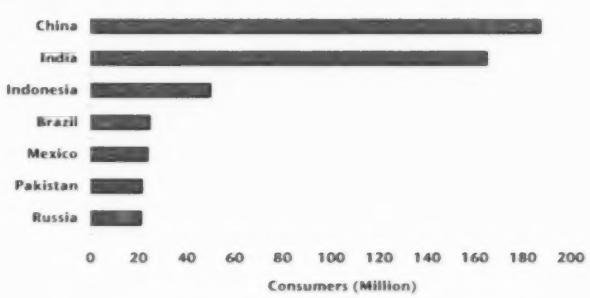
Source: Statistics Canada and AAFC calculations.
Note: *For Russia, 1993-1995 average instead of 1991-1995.

- **Emerging economies offer future growth opportunities since they are increasing their standard of living. About half a billion people in developing countries entered the middle class in the last decade.**

  Researchers estimate that world food demand could double by 2050. Half the increase is expected to be driven by higher per capita income in developing countries and half by world population growth. (Source: American Farm Bureau).

Chart B2.18

Increase in Middle Income Consumers, 1996-2006



Source: American Farm Bureau.

- **Per capita income growth in developing countries will lead to increased demand for agriculture and food products.**

  The greatest growth in the demand for food occurs as per capita income increases from US$2 per day to US$10 per day. Expenditure increases rapidly for a wide variety of foods of higher quality with a modest degree of processing. Most of this translates into rapidly growing demand for farm-level production.

Chart B2.19

People Living Below US$1/Day and US$2/Day, 2004

Country	Population (millions)	Percent of population living on	
		Less than US$1/day	Less than US$2/day
China	1,300	17	47
India	1,087	35	80
Indonesia	239	8	52
Brazil	184	8	22
Pakistan	159	13	66
Russia	144	6	24
Bangladesh	141	36	83
Nigeria	126	70	91
Mexico	105	10	26

Source: World Bank, World Development Indicators Database.

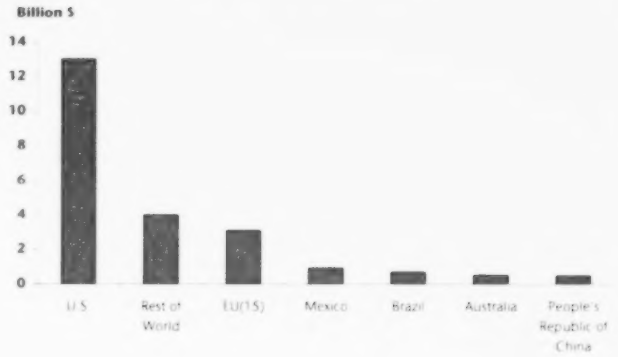
Other countries are also becoming more competitive and Canada is importing more from them

- **Canada is importing more agricultural and food products from both traditional and non-traditional trading partners.**

  Emerging economies such as China are also low cost producers and are becoming increasingly competitive in international markets.

Chart B2.20

Value of Canadian Agriculture and Agri-Food Imports by Country of Origin, 2006



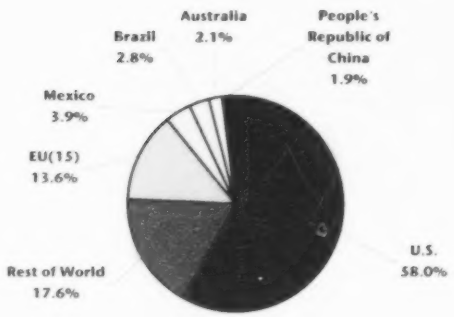
Source: Statistics Canada and AAFC calculations.

- **After the U.S., the EU(15) is Canada's main source of agriculture and agri-food imports,** accounting for nearly 14% of the total.

  About 3.9% and 2.8% of our imports are coming from Mexico and Brazil respectively.

Chart B2.21

Canadian Agriculture and Agri-Food Imports by Country of Origin, 2006



Source: Statistics Canada and AAFC calculations.

SECTION B3

Competitiveness, Productivity Growth and Innovation

Innovation is the key to the agriculture and agri-food system's long-term prosperity. Innovation improves the manner in which capital and labour inputs are combined, resulting in more efficient and effective production. This contributes to increased productivity growth and enhanced competitiveness. Innovation can also lead to the development of new products, and business alliances which also enhance competitiveness. R&D, capital investment and suitable skilled labour are essential to the innovation process.

The prosperity of the agriculture and agri-food sector depends on its ability to compete in world markets, and this has improved over time

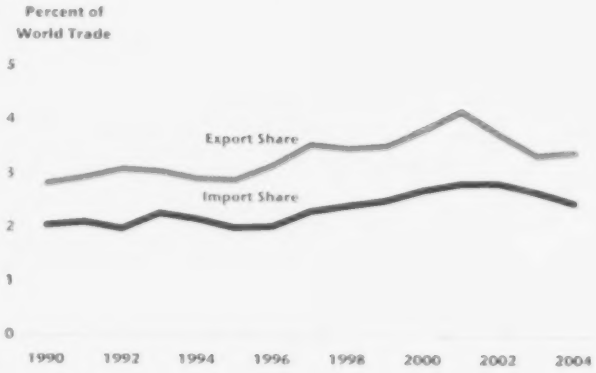
- **Canada's agriculture and agri-food sector has become increasingly competitive in world markets as indicated by its share of world agriculture and agri-food trade.**

Agriculture and agri-food exports have grown significantly since the early 1990s, from $10.7 billion in 1990 to $28 billion in 2006.

Canada's share of world agri-food trade has declined more recently, partly as a result of the appreciation of the Canadian dollar and growing trade from emerging economies such as China and Brazil.

Chart B3.1

Canada's Share of World Agriculture and Agri-Food Trade, 1990-2004



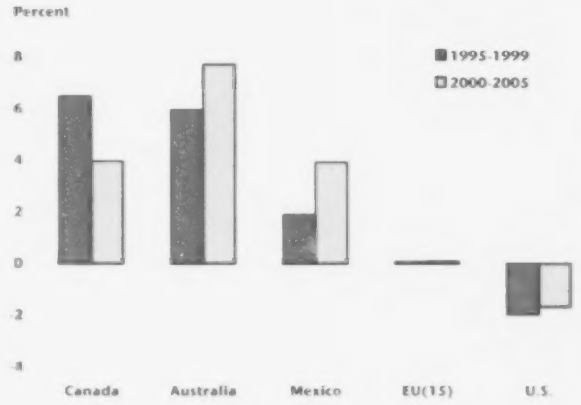
Source: Statistics Canada, FAO and AAFC calculations.

Other indicators of the sector's competitiveness show Canada's competitiveness in trade in various agricultural products over time

- **Canada's competitiveness in live animals as measured by relative trade advantage (RTA) is higher than that of its major trading partners.**

  Although Canada's RTA for bovine, declined in the early 2000s due to the BSE outbreak and the associated trade restrictions imposed by the U.S. and other countries in 2003, it is still higher than that of the U.S., Mexico and the EU(15).

Chart B3.2
RTA for Live Bovine, 1995-2005



Source: AAFC calculations based on Global Trade Atlas

- **Canada's competitiveness in live hog trade has increased since the late 1990s whereas that of Canada's major competitors has declined.**

Chart B3.3
RTA for Live Hogs, 1997-2005

Source: AAFC calculations based on Global Trade Atlas

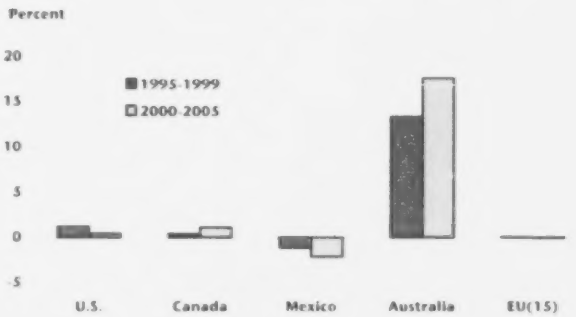
Relative Trade Advantage (RTA) is measured by a country's net share of world trade in a given product relative to the net trade of all traded goods.

Canada has also improved its competitiveness in processed food products, such as pork and grain milling

- **RTAs for some processed products have improved relative to the U.S. and Mexico, particularly between 2000 and 2005.**

  RTA for beef products increased between 1995 and 2005 in Canada whereas it decreased in the U.S. and Mexico during the same period. Australia is significantly more competitive than Canada in beef processing, with a higher RTA.

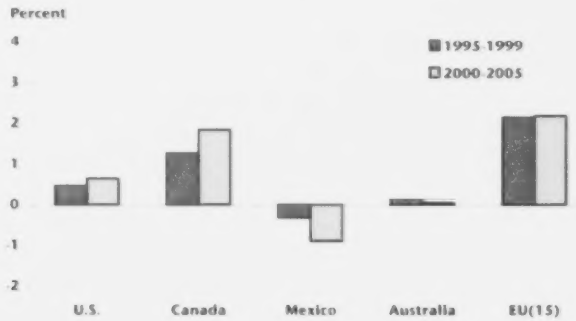
Chart B3.4
RTA for Beef, 1995-2005



Source: AAFC calculations based on Global Trade Atlas.

- **RTA for pork also increased faster in Canada than for its major competitors.**

Chart B3.5
RTA for Pork, 1995-2005

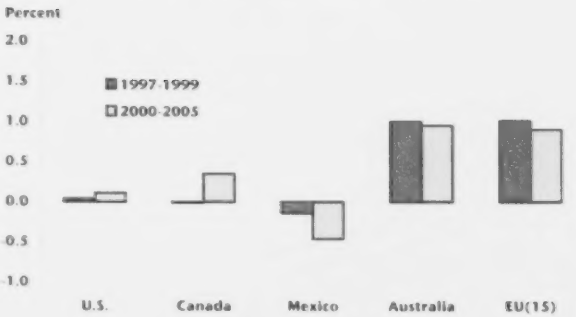


Source: AAFC calculations based on Global Trade Atlas.

- **RTA for grain milling has also increased significantly in Canada compared to that of its major competitors over the past decade.**

  The RTAs for Australia, EU(15) and Mexico have declined over the same period.

Chart B3.6
RTA for Grain Milling Products, 1997-2005



Source: AAFC calculations based on Global Trade Atlas.

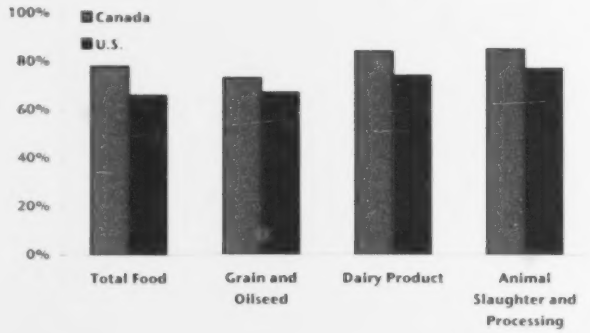
However, Canadian costs of production are higher than in the U.S. for many food processing industries, and its competitive position is deteriorating as labour costs have been rising

- **In Canada, cost of production accounted for almost 80% of food manufacturing shipments compared to about 70% in the U.S. in 2003.**

  Cost of production in Canada is particularly higher for dairy products, and animal slaughter and processing.

Chart B3.7

Cost of Production as a Share of Food Processing Shipments Canada-U.S., 2003



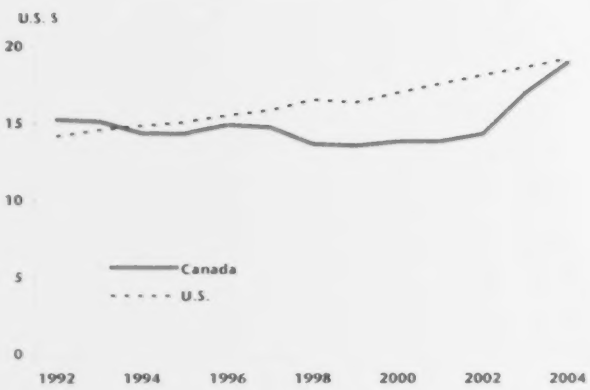
Source: Statistics Canada, Annual Survey of Manufactures
Note: Includes materials cost and wages

- **The cost of labour in Canadian food manufacturing industries, which has been lower in the past relative to that of the U.S., has been rising in recent years and was at par with that of the U.S. in 2004.**

  The hourly compensation cost in food manufacturing in Canada increased from US$13.80 per hour in 2000 to US$19.00 in 2004.

Chart B3.8

Hourly Compensation Costs in Food, Beverage and Tobacco Manufacturing, 1992-2004



Source: U.S. Bureau of Labor Statistics

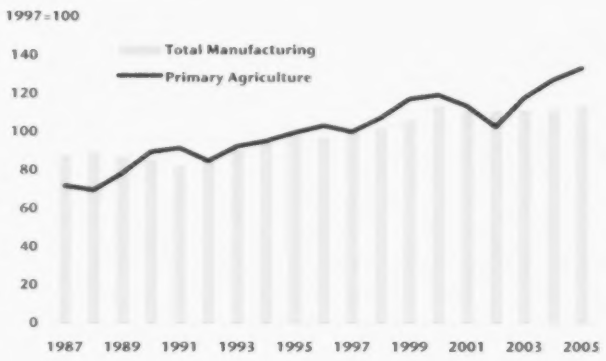
Productivity growth, which is essential for reducing costs and expanding output has been slowing in the Canadian food processing sector

- **Historically, total factor productivity (TFP) in primary agriculture compared well with that of manufacturing, although it is relatively more volatile than manufacturing.**

  TFP in primary agriculture has increased by 33% since 1997 compared to 13% for total manufacturing.

Chart B3.9

Total Factor Productivity Growth in Primary Agriculture, 1987-2005



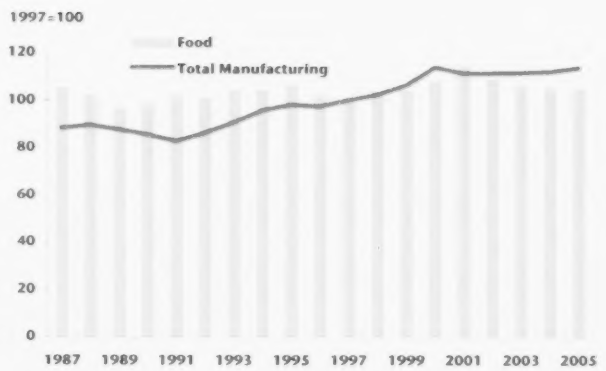
Source: Centre for the Study of Living Standards

- **TFP for the food processing industry has been declining in recent years.**

  TFP grew at an average annual rate of 1% in the 1990s, faster than manufacturing but declined at an average annual rate of 1% since 2001, falling below that of total manufacturing.

Chart B3.10

Total Factor Productivity Growth in Food Processing and Total Manufacturing, 1987-2005



Source: Centre for the Study of Living Standards

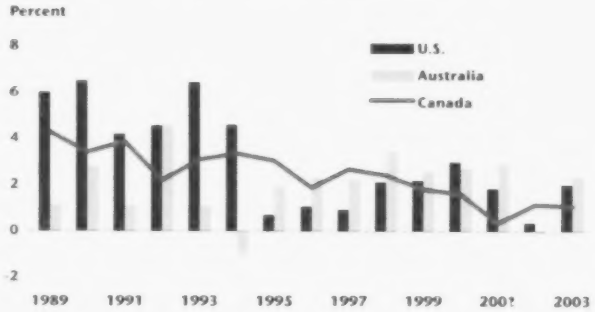
Compared to other OECD countries, the sector's productivity growth has slowed as well

- **TFP growth in primary agriculture in Canada has declined over time as in the U.S. and Australia but has not rebounded as fast as these two countries since 2002.**

  Since 1989, productivity growth in agriculture has slowed in the U.S. and Canada.

Chart B3.11

International Comparison of Total Factor Productivity Growth in Primary Agriculture, 1989-2003



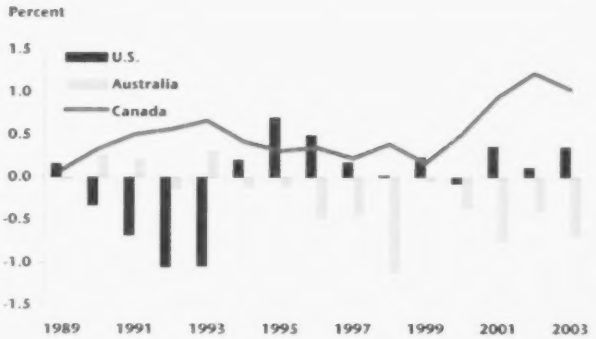
Source: Groningen Growth and Development Centre, Industry Growth Accounting Database, 2006.
Note: Includes forestry and fishing.
Ten-year simple moving average.

- **TFP growth in food processing in Canada has been less volatile than that in the U.S. and Australia since 1989. It still grew sharply between 1999 and 2003 in Canada compared to slowing in the U.S. and Australia.**

  Food processing is considered a mature industry that does not grow quickly, but investments and innovations have contributed to productivity improvements in recent years.

Chart B3.12

International Comparison of Total Factor Productivity Growth in Food and Beverage Processing, 1989-2003



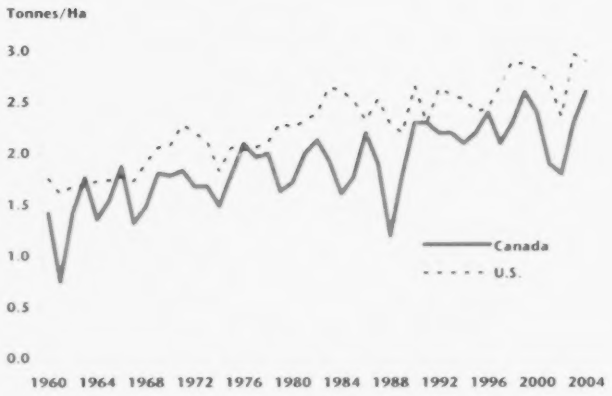
Source: Groningen Growth and Development Centre, Industry Growth Accounting Database, 2006.
Note: Ten-year simple moving average.

Productivity growth in agriculture has been the result of technological change and innovation

- **Wheat yields have increased substantially over the past four decades in both Canada and the U.S as a result of R&D in new hybrids and agronomic practices.**

Wheat yields in Canada, although lower than in the U.S., have increased at a faster rate, and almost doubled over the past four decades from 1.4 tonnes/ha to 2.6 tonnes/ha.

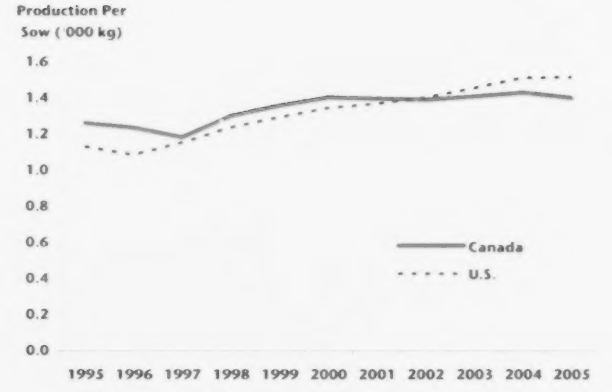
Chart B3.13
Wheat Yields, 1960-2004



Source: Statistics Canada, Crop Statistics; USDA, National Agricultural Statistics
Note: Wheat yields is amount of wheat produced per hectare

Pork yields in Canada have also kept pace with that of the U.S. and increased by about 140 kg/sow between 1995 and 2004 due to improvements in feed and production practices.

Chart B3.14
Pork Yields, 1995-2005



Source: USDA and AAFC
Note: Pork yields is the number of pigs per litter

Innovations have also been taking place in food processing, primarily in collaboration with supply chain partners

- **About 37% of food manufacturing establishments introduced at least one product innovation new to North America between 2001 and 2003. About 23% of establishments also introduced at least one process innovation new to North America.**

  There are variations across industries with fruits, vegetable preserving and specialty food products; and sugar and confectionery establishments more likely to introduce product and process innovations.

Chart B3.15
Extent of Innovation in Food Processing , 2001-2003

Industry	% of Establishments	
	Product	Process
Animal Food	29.4	12.9
Grains & Oilseeds	32.2	29.5
Sugar & Confectionery	47.3	41.8
Fruit, Vegetable Preserving & Specialty Food	54.6	35.8
Dairy	43.1	27.0
Meat (excl. Poultry)	31.5	15.4
Poultry Processing	43.8	15.4
Seafood	15.6	15.0
Bakeries & Tortilla	45.7	22.8
Other Food	42.9	27.8
Total Food Processing	**36.8**	**22.5**

Source: AAFC, The Nature and Extent of Innovation in the Canadian Food Processing Industry

- **The majority of establishments in the food processing industry collaborate with ingredient suppliers, raw agricultural product suppliers and packaging suppliers to develop new products and new processes.**

  Fewer food processing establishments collaborate with private and public research institutions in the innovation process.

Chart B3.16
Extent of Collaboration with Supply Chain Partners, 2001-2003

Partner Group	% of Establishments	
	Product	Process
Food Ingredient Suppliers	40	14
Packaging Suppliers	27	23
Raw Agricultural Products Suppliers/Organizations	22	9
Food Retailers/Wholesalers	22	5
Equipment Suppliers	20	37
Consultants	17	16
Commercial Laboratories or R&D Enterprises	15	7
Foodservice Operators	14	3
Universities and Colleges	12	6
Federal/Provincial Government Research Facilities	8	5
Competitors	5	3
Private Research Institutions	4	2

Source: AAFC, The Nature and Extent of Innovation in the Canadian Food Processing Industry

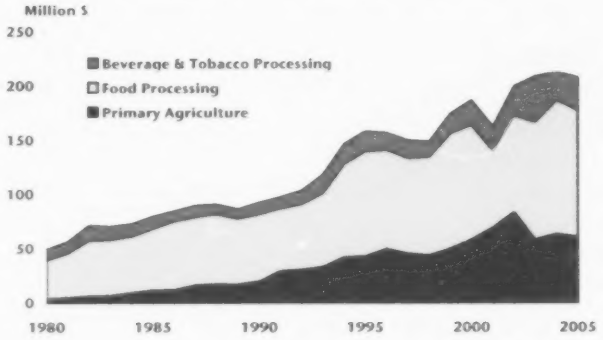
Innovation and productivity improvements occurred as a result of investments in R&D in the past, but R&D spending is slowing in food processing

- **Private industry R&D expenditure in the agriculture and agri-food sector increased by 25% between 1980 and 2000 but has declined in the past few years.**

  Private sector R&D spending in primary agriculture, in particular, decreased from $84 million in 2002 to $61 million in 2005. This is due to a decline in expenditures on research wages.

Chart B3.17

Private Industry's R&D Expenditures in the Agriculture and Agri-Food Sector, 1980-2005



Source: Statistics Canada.

Note: 1) 2004 and 2005 figures are preliminary.

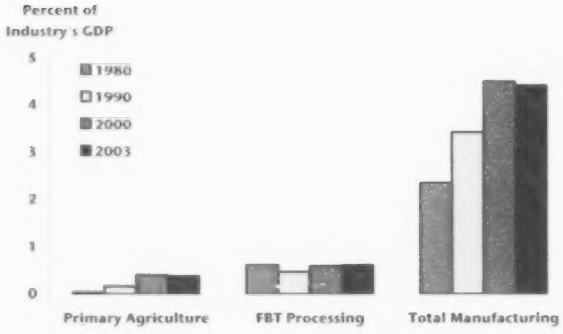
2) This includes all R&D expenditures made by private industry regardless of whether the sources of funds were self-financed, government grants/contracts or from other companies.

- **Private sector R&D spending as a share of GDP is considerably lower for primary agriculture and food processing compared to total manufacturing.**

  In 2003, 4.4% of GDP in manufacturing was spent on R&D, compared to only 0.4% in primary agriculture and 0.6% in food processing.

Chart B3.18

Private Industry R&D Expenditures as a Share of GDP by Industry, 1980-2003



Source: Statistics Canada.

Note: This includes all R&D expenditures made by private industry regardless of whether the sources of funds were self-financed, government grants/contracts or from other companies.

Canadian public research expenditures in the agriculture and agri-food sector, which have had high rates of return in the past, are declining

- **Rates of return to publicly-funded agricultural research in the past have been found to be high, ranging from 27% in wheat to 54% in swine.**

The high rates of return to agricultural research might be an indication that more resources could be devoted to agricultural research before the rates of return fall.

Chart B3.19

Rates of Return to Public R&D in Agriculture

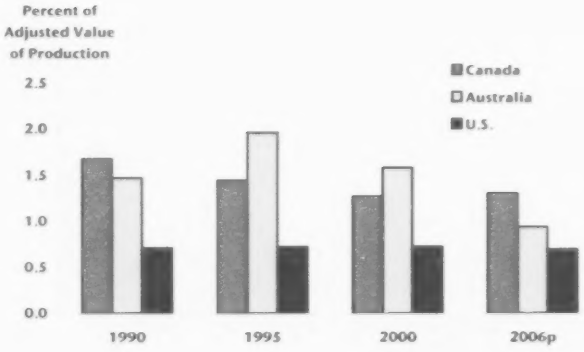
Rates of return to publicly-funded R&D in agriculture	
Beef (Klein et al. 1994)	30-37%
Wheat (Klein et al. 1996)	27-38%
Potato (Oxley et al. 1996)	28%
Swine (Thomas et al. 1998)	54%

Source: (Klein et al., 1994, 1996; Oxley et al., 1996; Thomas et al., 1998)

However, Canada's public R&D spending, as a share of production, declined from 1.7% in 1990 to 1.3% in 2006, although this is still higher than that of the U.S. Similarly, public sector R&D in Australia has also declined as a share of production.

Chart B3.20

Public R&D Support to Agri-Food Sector as a Share of Adjusted Value of Production, 1990-2006



Source: Agricultural Policies in OECD Countries: Monitoring and Evaluation 2007

Note: 2006 figures are preliminary.

In food processing, business R&D expenditures are lower than in other OECD countries

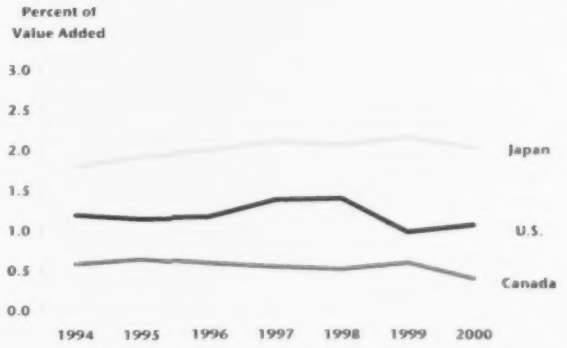
- **Canadian food processors spent only 0.4% of production on R&D compared to 1.1% in the U.S. and 2% in Japan.**

R&D expenditures as a share of value added in the Canadian food processing industry also declined between 1994 and 2000, whereas in Japan, they generally increased over the same period.

Canadian food processing may be benefitting from innovations taking place in other levels of the supply chain or at the head offices of foreign owners.

Chart B3.21

Business R&D Expenditures as a Share of Value Added in Food, Beverage and Tobacco in OECD Countries, 1994-2000



Source: OECD, DSTI, STAN Indicators, 2004

- **Some food manufacturing establishments in Canada are undertaking R&D with the majority involved more in prototyping and scale-ups than laboratory-based R&D.**

Between 2001 and 2003, only 45% of food processing establishments in Canada reported conducting or commissioning R&D.

Chart B3.22

Sources and Extent of R&D Expenditures in Food Processing, 2001-2003

Industry	% of Establishments		
	R&D Program	Lab-Based R&D Program	Prototypes and Scale-ups
Fruit, Veg. and Specialty Food	62.8	69.2	77.1
Poultry Products	59.9	67.5	95.6
Other Food	59.2	72.2	83.9
Grain and Oilseed Milling	58.8	81.3	67.9
Sugar and Confectionery	57.6	53.6	95.8
Dairy Products	57.6	74.3	67.5
Bakeries and Tortilla	47.7	64.7	81.4
Meat Products	38	74.7	70.7
Animal Food	29.5	57.7	51.1
Seafood Products	24.9	65.5	66.1
Total Food Processing	**45.1**	**68.3**	**75.3**

Source: AAFC, The Nature and Extent of Innovation in the Canadian Food Processing Industry

Impediments to innovation and R&D centre around the difficulty of acquiring capital

- **Whereas innovation and R&D are critical for productivity improvements, there are impediments, particularly, lack of financial capital, shortages of skilled workers and inflexible regulations and standards.**

The single most important factor impeding innovation and R&D in food processing is the lack of internally- generated cash flow.

Establishments which do not have enough internal cash flow to spend on innovation and R&D depend on external funding sources such as banks, cooperatives and credit unions, Canadian-based venture capital and the government.

Chart B3.23

Impediments to Innovation in Food Processing, 2001-2003

FACTOR	Percent of innovating establishments indicating medium or high importance
Lack of Internally Generated Cash Flow	42.2
Long Gestation Period of Innovation	37.4
Insufficient Flexibility in Regulations or Standards	37.3
Shortages of Skilled Workers	37.1
Lack of Marketing Capability	36.3
Lack of Retail Acceptance or Access to Distribution Channels	29.1
Lack of External Equity Funding	26.0
Lack of Debt Financing	25.2
Lack of Idea Champions	24.1
Corporate/Management Resistance to Innovation	15.8
Difficulty in Negotiating Clear Intellectual Property (IP)	9.3

Source: AAFC, The Nature and Extent of Innovation in the Canadian Food Processing Industry

- **Government incentives such as R&D tax credits and R&D grants are reported to be the most important government programs for innovation.**

About 70% of innovating food manufacturing establishments utilized R&D tax credits between 2001and 2002.

Canada's R&D tax credit program is considered one of the most generous R&D tax credit programs in the world.

Chart B3.24

Extent to Which Government Programs are Used, 2001-2003

	% of Establishments	
Source of Support	USE	Medium or High Importance
R&D Tax Credits	68.6	44.0
Government R&D Grants	42.6	20.6
Government-Supported Training Programs	40.8	12.9
Government Financing Support	38.5	17.4
Government Research Facilities	36.0	12.4
Export Development Assistance	32.7	8.5

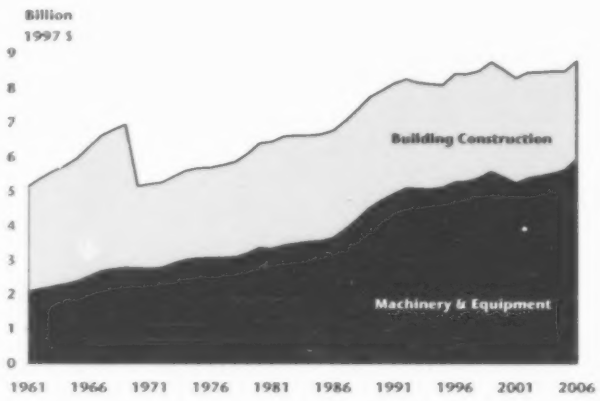
Source: AAFC, The Nature and Extent of Innovation in the Canadian Food Processing Industry

Investment in both capital and public infrastructure by the private and public sectors are also important factors that can contribute to productivity improvements in food processing

- **Capital stocks in food processing have increased over the past four decades at a relatively steady average annual rate of 1.5% since 1971.**

  Machinery and equipment stocks have increased at a faster average annual rate of 2.2% during the same time period.

Chart B3.25
Capital Stock in Food Processing, 1961-2006



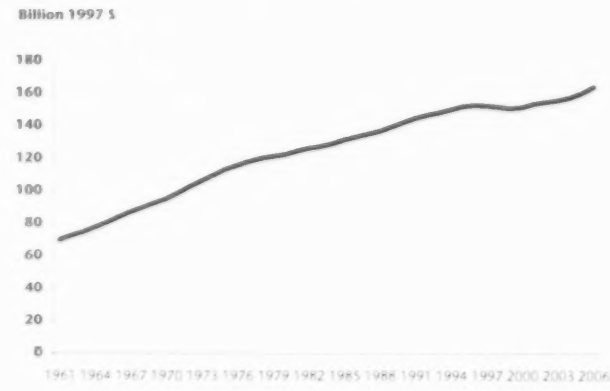
Source: Statistics Canada
Note: Geometric (infinite) end-year net stock

- **Investments in public infrastructure also increased over time at an average annual rate of about 3% between the early 1960s and 2000.**

  Infrastructure, such as roads and port facilities are important for the growth in the agriculture and agri-food sector.

  Research has shown that for every $1 spent on public infrastructure, food processing productivity has grown by $.03.

Chart B3.26
Total Stock of Public Infrastructure in Canada, 1961-2006



Source: Statistics Canada

A significant portion of investment comes from foreign sources through Foreign Direct Investment (FDI) in food and beverage processing

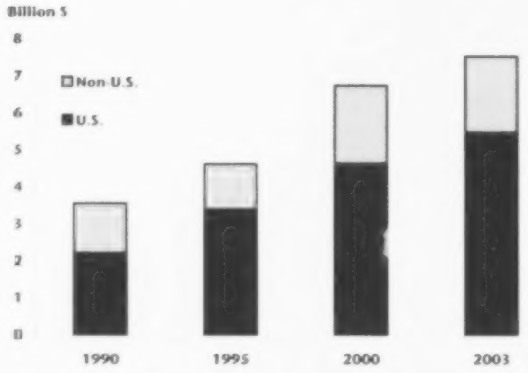
- **The Canadian food processing industry is very much connected to the U.S.**

  Most of the FDI in the Canadian food processing industry originates from the U.S.

  The U.S. accounted for 72% of all inward food processing FDI in Canada in 2003.

Chart B3.27

Accumulated FDI in Canadian Food Processing Industry by Country of Origin, 1990-2003



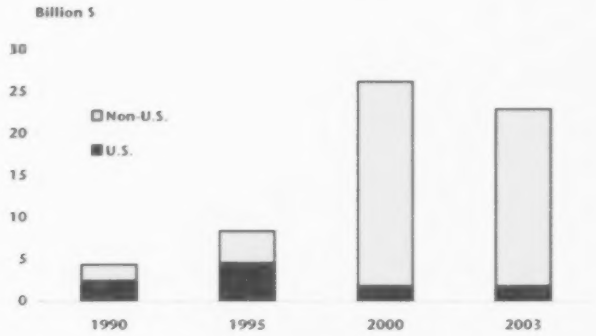
Source: Statistics Canada and AAFC calculations.

Note: SIC-C classification system.

- **FDI in the Canadian beverage processing industry, on the other hand, originated mostly from outside North America.**

Chart B3.28

Accumulated FDI in Canadian Beverage Processing Industry by Country of Origin, 1990-2003



Source: Statistics Canada and AAFC calculations.

Note: SIC-C classification system.

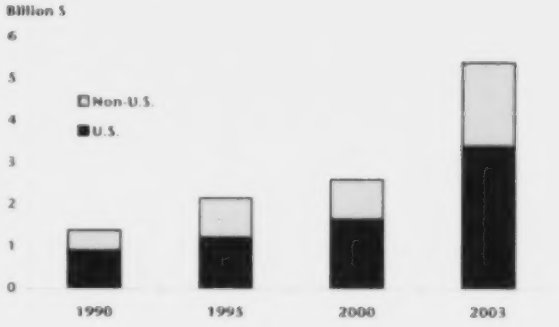
Canadian food and beverage processing firms have also been investing abroad

- **Canadian companies also invest in food processing industries in other countries.**

More than 60% of total outward food processing FDI by Canadian companies went to the U.S. in 2003.

Chart B3.29

Accumulated Outward Investment in Food Processing Industry by Country of Destination, 1990-2003



Source: Statistics Canada and AAFC calculations.

Note: SIC-C classification system.

For example, McCain Foods, a large Canadian multinational food processing company, has plants in about 20 countries around the world.

Chart B3.30

Locations of McCain Foods International Plant Facilities, 2006

Company	Locations of International Plant Facilities	
McCain Foods	Argentina	Poland
	Australia	Scandinavia
	Austria	South Africa
	Belgium	Spain
	France	Switzerland
	Germany	Taiwan
	Greece	United Kingdom
	Netherlands	United States
	New Zealand	

Source: McCain Foods Limited (http://www.mccain.com/mc_home.htm).

SECTION C

Components of the Agriculture and Agri-Food System

SECTION C1

Consumers

Canadian consumers are typical of consumers in developed economies. On average, they have a high standard of living and allocate a relatively small percentage of their total personal disposable income to food. In fact, for the average Canadian, the food expenditure share is declining.

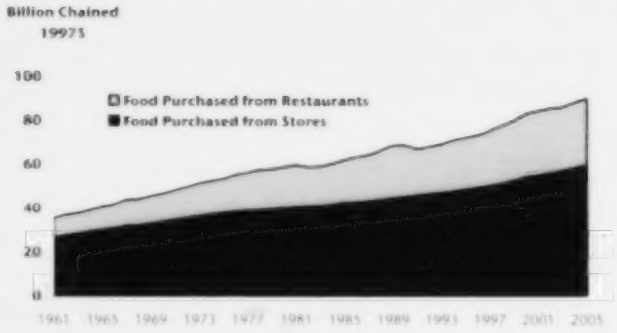
As incomes increase, consumers are able to look beyond food safety to other product attributes that reflect their divergent preferences and values. In response to consumer demands, the food industry is offering a variety of products which embody not only consumer preference for convenience and health considerations, but also the methods of production which address environmental, fair trade, and animal welfare issues.

For the average Canadian, food expenditures are rising but declining as a share of their total spending

- **Personal expenditures on food from stores and from restaurants continued to rise in Canada in 2005 to $60 billion and $30 billion respectively.** On a per capita basis, food expenditures rose to $2,798 per person with 33% being spent on restaurant meals.

Chart C1.1

Personal Expenditures on Food, 1961-2005



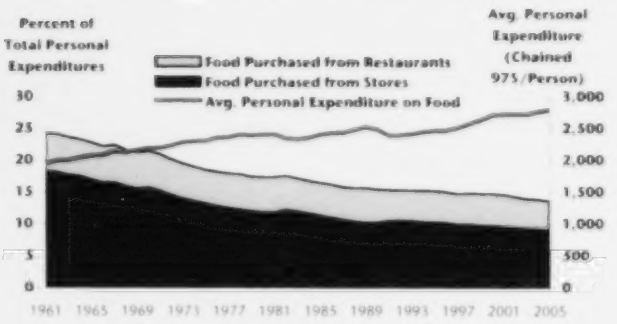
Source: Statistics Canada and AAFC calculations

- **Although the average real personal food expenditure has increased, its share in total personal expenditure has been declining for the past 45 years.**

  Higher personal disposable income (PDI) has meant that consumers are spending a greater share of their expenditures on other goods and services such as housing and durable goods.

Chart C1.2

Personal Expenditures on Food as a Share of Total Food Expenditures, 1961-2005



Source: Statistics Canada and AAFC calculations

- **In 2004 the household expenditure share for food and non-alcoholic beverages in Canada was about 10%, with alcoholic beverages and tobacco accounting for another 4%.**

  Among the selected OECD countries, Canada had the third lowest total household expenditure share for food, beverages and tobacco and ranked behind the U.S. at 9% and the U.K. at 13%.

Chart C1.3

Household Expenditure Share of Food, Beverage and Tobacco in Selected OECD Countries, 2004

Source: OECD

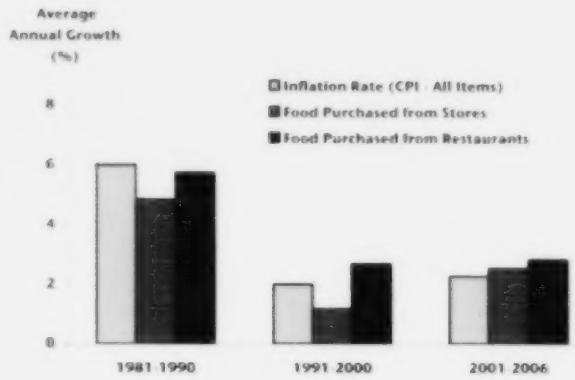
Food price increases have begun to outpace inflation

- **In the past, the growth in food prices was, in general, lower than overall inflation.**

  However, in recent years, the rate of food price increases has exceeded inflation, reflecting higher input and fuel costs used in manufacturing, packaging, transportation, etc.

  For example, in the first five months of 2007, retail food prices rose at an average monthly rate of 3.2% compared to the average overall inflation of 2.2% over the same period.

Chart C1.4
Consumer Price Indices (CPI) for Food and all Goods and Services, 1981-2006



Source: Statistics Canada and AAFC calculations.

Societal concerns are increasingly influencing the food preferences of Canadian consumers

- **Nutrition and food quality are two major considerations for consumer food choices in Canada.**

  Nutrition is an important consideration when buying food for the home, whereas quality continues to be the top consideration when dining out. Other considerations include price, variation in food choices, food safety and primary production.

Chart C1.5

Considerations for Food Purchased for the Home and when Dining Out, 2006

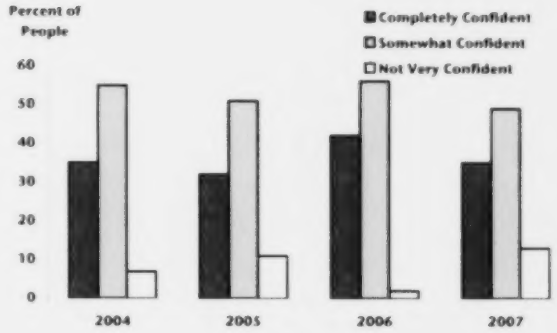
Source: Consumer Perceptions of Food Safety and Quality Wave 2 Tracking 2006, AAFC

- **The confidence of Canadians in the safety of food products is positive and relatively stable.**

  Over the past four years, Canadians have maintained their confidence in the safety of the food they purchase. Consumers associate food safety with quality controls and inspections related to food production, handling and processing practices. Managing animal disease as well as managing the concern of hormones, antibiotics and chemicals in plants and animals are the most important factors in maintaining Canadian consumer confidence.

Chart C1.6

Consumer Confidence in Safety of the Food Supply, 2004-2007



Source: Consumer Perceptions of Food Safety and Quality 2004, AAFC
Growing Canada Benchmark Study 2005, AAFC
Consumer Perceptions of Food Safety and Quality Wave 2 Tracking 2006, AAFC
AAFC Omnibus Survey 2007

Organic sales continue to grow as consumers are willing to pay a premium for these products

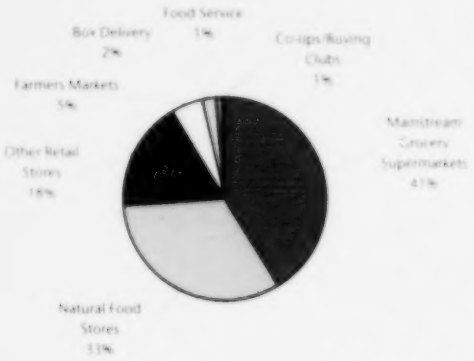
- **Purchases of organic food products are still on the rise, although they represent a very small proportion of the total value of food sold.**

  Retail sales of certified organic food in Canada was estimated to be worth more than $1 billion in 2006. Mainstream grocery supermarkets accounted for only 41% of total organic food sales.

  Although the share of sales of organic food products in grocery supermarkets represented only 0.9% of total grocery sales, organic food sales in this market channel grew at a rate of 28% between 2005 and 2006.

Chart C1.7

Estimates of Organic Food Sales Retail Market Channels, 2006



Source: Organic Agricultural Centre of Canada (OACC), "Retail Sales of Certified Organic Food Products, in Canada"

- **Organic fruits and vegetables are leading the market, although organic meat consumption is growing faster.**

  Of all organic product categories, fresh and canned fruits and vegetables lead sales across provinces with a 41% share of the organic food market. Although raw organic meat, fish and poultry have a small market (1%), it is rapidly expanding. Between 2005 and 2006, it grew by 81%.

  Nearly 6 in 10 consumers reported buying either organic fruits and vegetables or organic meats in 2006.

Chart C1.8

Estimates of Organic Food Sold in Canadian Supermarkets, 2006

Source: Organic Agricultural Centre of Canada (OACC), "Retail Sales of Certified Organic Food Products, in Canada"

Organic products are differentiated from conventional products by commanding a price premium that reflects the higher unit cost of production and consumer preferences for organically-produced foods

- **Price premiums, measured as price differentials between organic and conventional foods, are highly variable across product categories, brands, and time.**

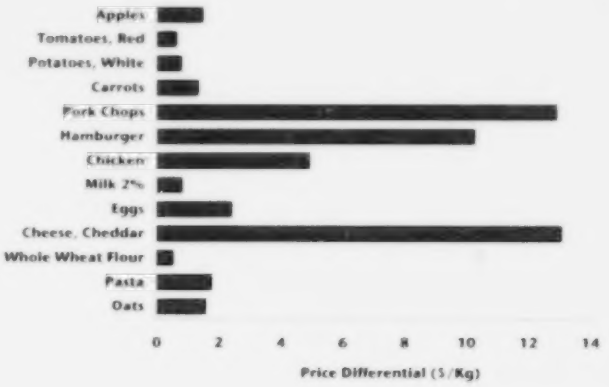
The high variability of price premiums for organic foods may suggest that organic foods are more price sensitive compared to conventional ones. An important reason may be that organic foods have a low budget share compared to conventional foods and may be subject to more price comparison as they are introduced in the market.

Nevertheless, due to the relatively limited supply of organic products, price premiums are determined by supply and demand.

At the request of industry and after significant consultations, regulations introducing mandatory National Organic Standards in Canada were announced in December 2006. These regulations aim to protect consumers against deceptive and misleading labelling and provide assurance to consumers. They will also allow access to the European market given that specific standards are now required.

Chart C1.9

Price Differentials between Selected Organic and Conventional Foods, January 2004



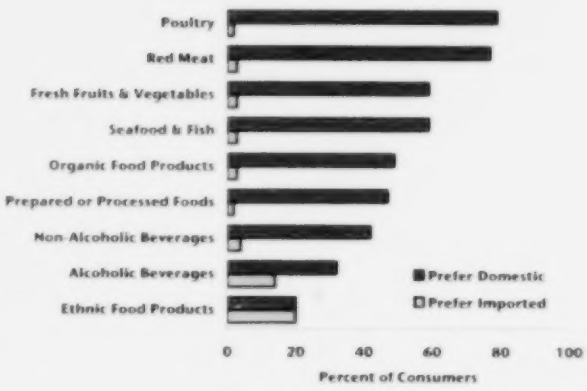
Source: Organic Agriculture Centre of Canada (OACC)

Canadian consumers demonstrate a strong interest in supporting domestic production

- **Consumer interests in healthy and high quality food products and environmental sustainability have resulted in a growing demand for domestic/local products.**

  These consumer attitudes are, in part, creating a resurgence in venues and programs connecting producers and consumers, such as farmers' markets, direct farm sales and municipal/regional marketing programs.

Chart C1.10
Consumer Preferences for Buying Meals Imported vs. Domestic



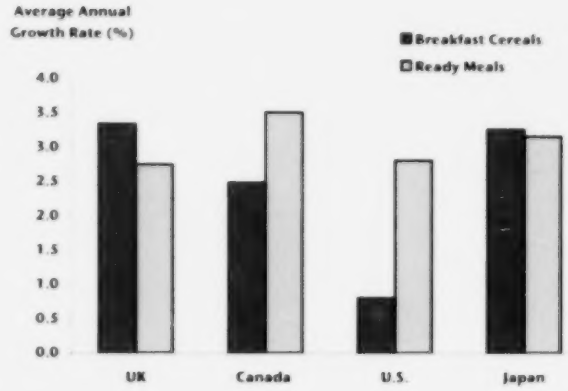
Source: Domestic Branding Survey, AAFC, 2007

- **International consumers are also changing their preferences and this will influence the Canadian agri-food sector's opportunities for trade**

  Consumers have shifted their consumption towards higher value products across countries. Among wealthier countries, the demand for food that is healthy, safe and convenient is growing.

  Packaged food products, such as breakfast cereals and ready meals account for large shares of total food expenditures among consumers where demand for convenience is growing. The U.S., the EU and Japan account for over half of the total global sales of packaged products.

Chart C1.11
Average Annual Growth Rate in Retail Sales of Packaged Products, 2002-2006



Source: Euromonitor 2007

SECTION C2

Food Distribution

(Retail/Wholesale and Foodservice)

Food retail is a major component of Canada's agriculture and agri-food system. Food retailers are responding to consumers' increasingly diverse range of food preferences by restructuring to maintain and increase their market share, resulting in increased concentration. Foodservice establishments also continue to adjust product/service offerings to increase sales in response to competition from food retailers who are offering consumers convenience with an increasing variety of prepared food and take-home meals.

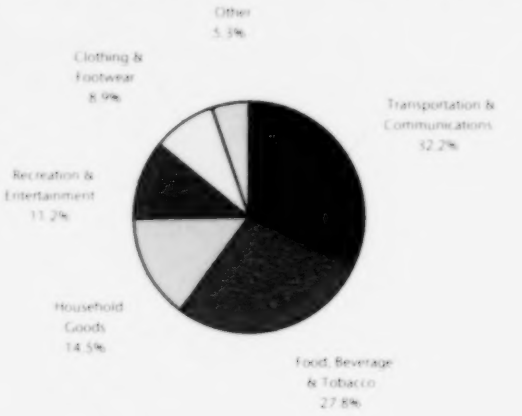
Food distribution and foodservice are major components of Canada's agriculture and agri-food system

- **Food, beverage and tobacco (FBT) expenditures represent the second largest consumer goods expenditure category.**

  In 2005, Canadians spent $100 billion (or 28% of their total personal expenditures on goods) on food, beverage and tobacco products purchased from stores.

Chart C2.1

Distribution of Personal Expenditure on Goods, 2005



Source: Statistics Canada

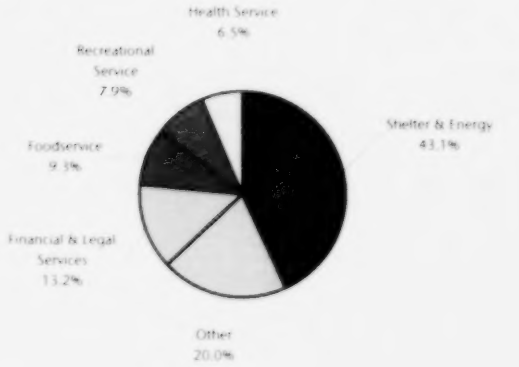
- **Foodservice is the third largest consumer service expenditure category.**

  In 2005, Canadians spent $37 billion on foodservice accounting for 9.3% of personal expenditure on services in Canada.

  Together, food expenditures at retail and foodservice establishments ($137 billion), accounted for 18% of personal expenditures on goods and services.

Chart C2.2

Distribution of Personal Expenditure on Services, 2005



Source: Statistics Canada

Food retailing is becoming more consolidated both at home and abroad

- **Significant store rationalization has occurred during the past decade, with a move to larger operations.**

  Although the total number of food stores has stabilized at approximately 24,000 stores, chain stores are increasing their number of branch and franchise stores in Canada. In 2005, Loblaws had 1,072 corporate/franchise stores, and Sobeys 1,310 stores.

  In 2005, Metro Inc. acquired A&P Canada making Metro the third largest food retailer in Canada, behind Loblaws and Sobeys.

Chart C2.3
Number of Canadian Food Stores and Average Sales, 1990-2006

Source: Canadian Grocer, Statistics Canada, and AAFC calculations.

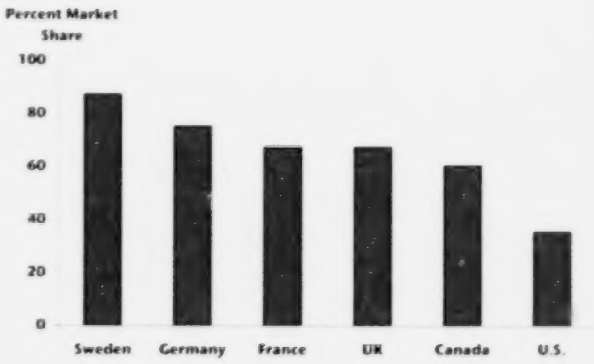
Note: 2006 figures are estimates.

- **The five largest food retailers in Canada accounted for about 60% of national grocery sales in the late 1990s, up from 50% a decade earlier, while the share of independent retailers decreased from 47% to 39% over the same period.**

  The five largest food retailers in Canada include Loblaws, Sobeys, Metro, Canada Safeway and Costco.

  Some European countries had higher levels of retail food store concentration than Canada, while the U.S. had a lower level overall in the late 1990s. However, on a regional basis, food retail concentration in the U.S. is high.

Chart C2.4
Market Share of Top 5 Food Retailers, Selected Countries, 1997-1999



Source: AAFC calculations based on Dobson Consulting, (1999) and USDA sources.

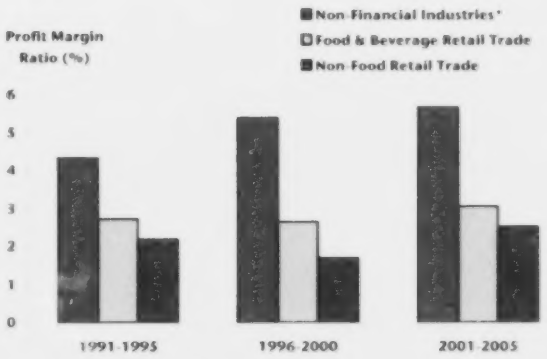
Canadian food and beverage retailers have relatively stable profit margins

- **Canadian food and beverage retailers have profit margins that are above non-food retailers but below the overall non-financial sector.**

Since the early 1990s, food and beverage retailers have seen profit margins hover around 2.8% annually, while non-food retailers have experienced profit margins around 2.1% per year. The total non-financial sector, which includes all sectors except financial services has experienced a rise in profit margins to over 5% since 1996.

Chart C2.5

Average Profit Margin Ratio for Food and Beverage Retailers, 1991-2005



Source: Statistics Canada and AAFC.

Note: *See glossary for definition of the profit margin ratio and non-financial industries. Does not include government-controlled cooperatives, for example LCBO, SAQ.

However, lines between food retail and non-food retail, food wholesale and food processing are becoming blurred

- **Lines between food and non-food retailers are becoming blurred as department stores, drug stores and gas stations are increasingly selling food items while traditional food retailers/ wholesalers have expanded their non-food selections.**

  Lines between food retail and upstream industries are also becoming harder to distinguish.

  Food retail and wholesale operations are largely integrated with large retailers owning their own wholesale operations.

Chart C2.6
Food Retail Channel Share, 2004

	%
Food and Beverage Stores	82.1
General Merchandise Stores	8.5
Gas Stations and Automotive Dealers	2.5
Drug Stores	1.4
Other	0.3

Source: Statistics Canada, Quarterly Retail Commodity Survey, Special Tabulation

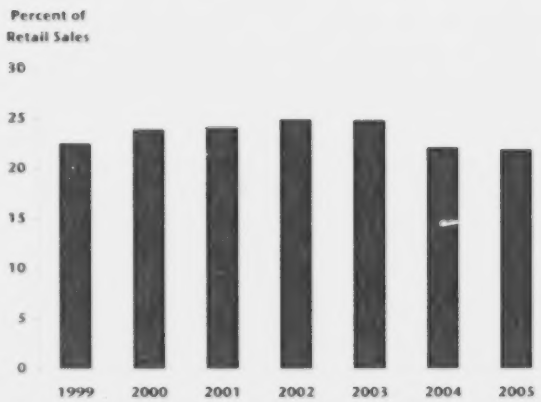
- **More and more food retailers are selling their own private labels.**

  At the same time, more and more manufacturers are willing to develop partnerships to gain a share of this market.

  Changes in consumer demands as well as cost efficiencies, quality requirements and product differentiation have been driving the growth of private labels by retailers.

  Private label sales represent no less than 20% of the total sales of major Canadian retailers. For instance, sales of "President's Choice" represented more than a quarter of Loblaws' total sales (28%) in 2003.

Chart C2.7
Private Label Share in Canada, 1999-2005



Source: A.C. Nielsen

Most meals are still eaten at home, but foodservice is an increasing component of household expenditures

- **Almost 70% of all Canadian meals are prepared and eaten at home.**

  Commercial foodservice accounts for around 10% of all meals.

Chart C2.8

Where Canadians Eat Their Meals, 2005

	% of Meals
In-Home–From Retail	67
At a Restaurant	8
Skipped Meals	8
Carried From Home	8
All Other Away-From-Home	7
In-Home–From Restaurants	2
In-Home– Home Meal Replacement	1

Source: Canadian Restaurant and Foodservices Association.
(Sourced from Eating Patterns in Canada Report 2005, NPD Group Canada Inc.)

- **The average Canadian family visits a restaurant for a meal or snack approximately 520 times per year and spends about one-fifth of their total household food expenditures on these meals and snacks.**

  Residents of Manitoba, British Columbia, Ontario and Alberta spend a larger share of their food expenditures on restaurant meals than the residents of other provinces.

  Differences in provincial sales tax (PST) do not explain these differences as only in Alberta, Saskatchewan and Ontario are restaurant meals under $4.00 exempt from PST.

Chart C2.9

Household Spending on Food by Province, 2005

Source: Statistics Canada and AAFC calculations.

Note: Food purchased from stores includes board paid to private households.

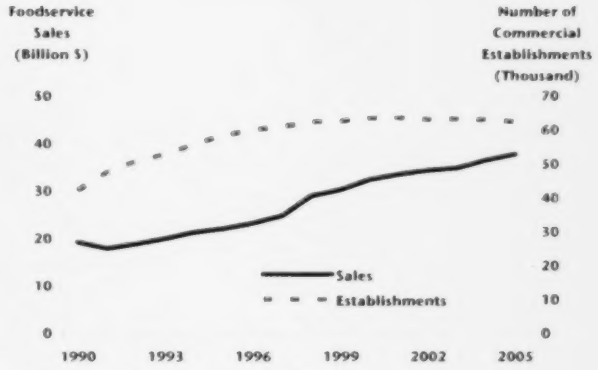
Foodservice sales are growing over time

- **Commercial foodservice sales have increased significantly since 1990, while the number of establishments have stabilized.**

  In 2005, there were around 63,000 commercial foodservice establishments in Canada, of which one-third were in Ontario.

  Total foodservice sales on the other hand, have almost doubled since the early 1990s.

Chart C2.10
Commercial Foodservice Sales and Number of Establishments, 1990-2005



Source: Canadian Restaurant and Foodservices Association and Statistics Canada.

- **When Canadians eat out, they tend to prefer more to less service.** More than one-third of sales in commerical foodservice occurs at full-service restaurants.

  Non-commercial foodservice sales account for about 22% of total foodservice sales.

Chart C2.11

Market Share by Foodservice Category, 2006

	%
Commercial Foodservice	**78**
Full-Service Restaurants	37
Limited-Service Restaurants	30
Contract and Social Caterers	6
Pubs, Taverns and Nightclubs	5
Total Non-Commercial Foodservice	**22**
Accomodation Foodservice	10
Institutional Foodservice	6
Retail Foodservice	2
Other Foodservice	4

Source: Canadian Restaurant and Foodservices Association and AAFC calculations.

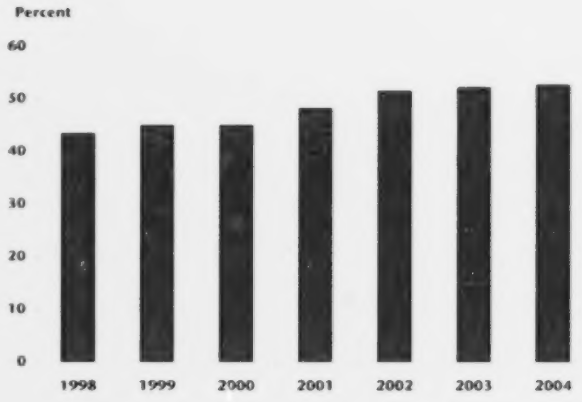
Note: 2006 figures are preliminary.

Foodservice is becoming increasingly concentrated, but a significant share is still operated by independent proprietors

- **Commercial foodservice remains quite fragmented with 62% of locations owned by independent retailers rather than chains.** However, concentration is increasing as chain restaurant companies continue to expand.

  In 2004, the top 50 foodservice companies accounted for 52.5% of commercial foodservice sales, up nine percentage points from 1998.

Chart C2.12
Top 50 Foodservice Companies' Share of Commercial Foodservice Sales, 1998-2004



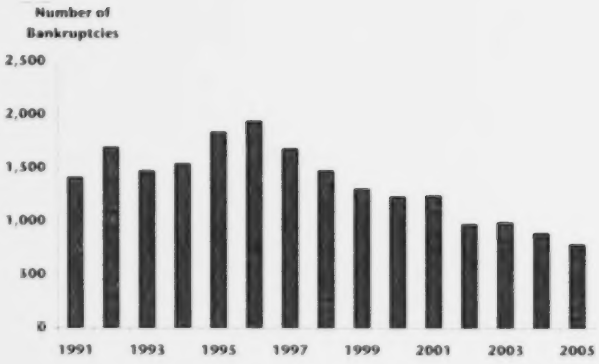
Source: Canadian Restaurant and Foodservices Association

- **Commercial restaurant bankruptcies fell by 12% in 2005 compared to 2004.**

  The number of bankruptcies has declined considerably from a high of 1,933 in 1996 to 777 in 2005.

  The Canadian Restaurant and Foodservices Association reports that the average profit margin for foodservice operators was 3.6% in 2005.

Chart C2.13
Commercial Restaurant Bankruptcies, 1991-2005



Source: Canadian Restaurant and Foodservices Association, Quarterly InfoStats

SECTION C3

Food, Beverage and Tobacco (FBT) Processing

The domestic food processing industry is the link between farmers, retailers, and international consumers. This link has become increasingly integrated as food processors integrate with both farmers and retailers domestically and abroad to provide consumers with the products they demand. The Canadian food processing industry has faced significant challenges in the last few years as a result of an appreciating dollar, increasingly tight labour markets, which have driven up labour costs, higher input prices for raw materials and increased international competition.

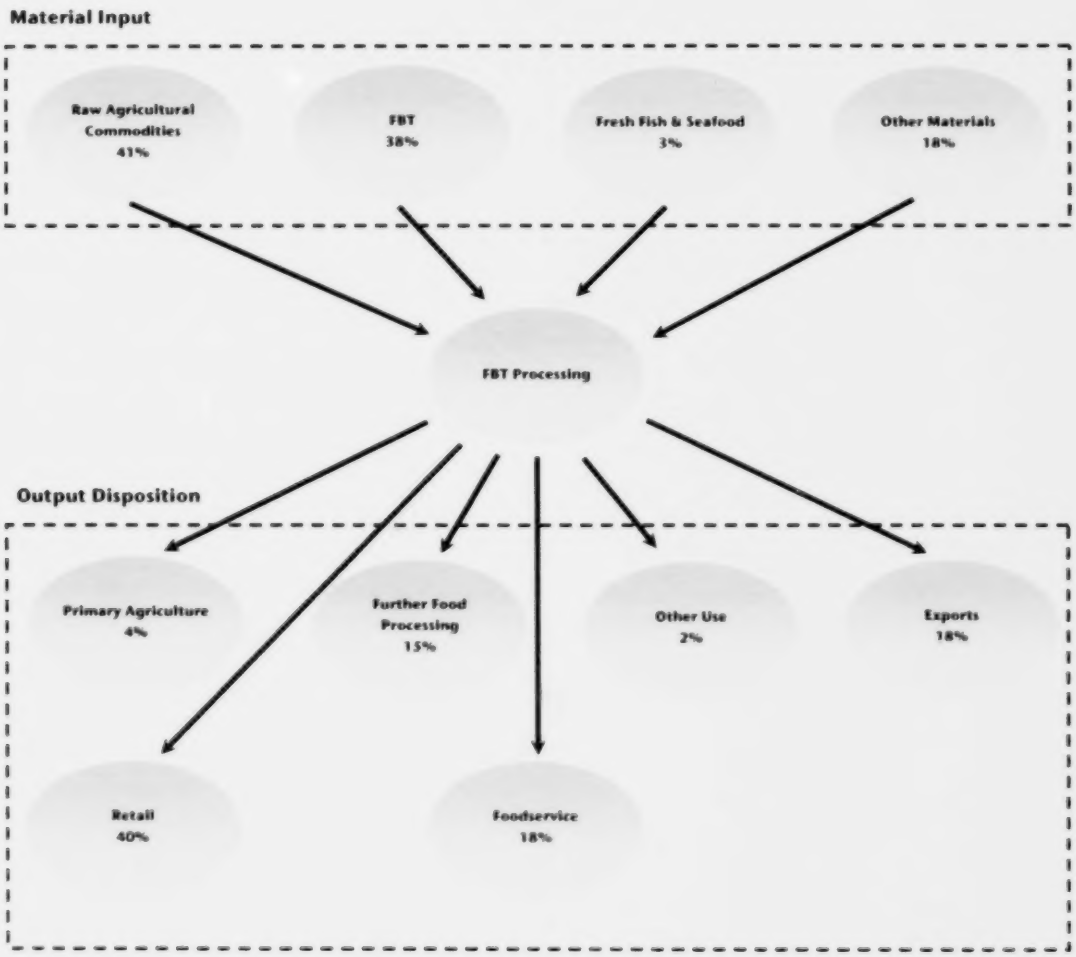
FBT processing is a collection of industries that are increasingly integrated with the farm and retail sectors

- **FBT processing is a collection of industries ranging from primary processors, such as flour mills and abattoirs, to further processors, such as bakeries and meat canneries.**

Raw agricultural commodities and fresh fish and seafood make up 44% (or $18 billion) of the total value of material inputs into FBT processing. FBT products that go into further processing make up another 38% (or $16 billion). The remaining 18% of input value is largely packaging materials, energy, chemical additives and equipment.

FBT processing output is either exported (18%), sold to food retailers (40%), foodservice providers (18%) or used in further processing (15%).

Chart C3.1
Food Processing Input Composition and Output Disposition, 2003



Source: Statistics Canada Input/Output Model and AAFC calculations.
Note: Does not add up to 100% due to missing confidential data.

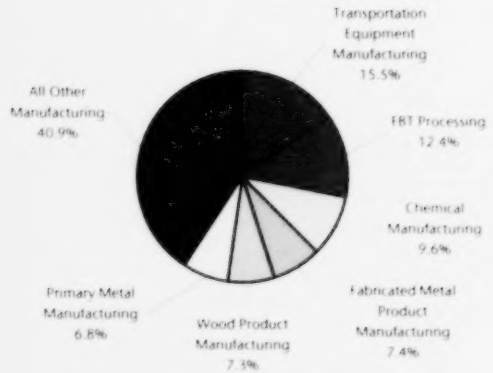
FBT processing is one of the most important manufacturing sectors in Canada

- **FBT processing is the second largest contributor to total manufacturing GDP in Canada, following transportation equipment manufacturing**.

  In 2005, FBT processing's share of manufacturing GDP was 12.4%, with food processing alone accounting for nearly 10%.

Chart C3.2

Distribution of Total Manufacturing GDP by Sector, 2005

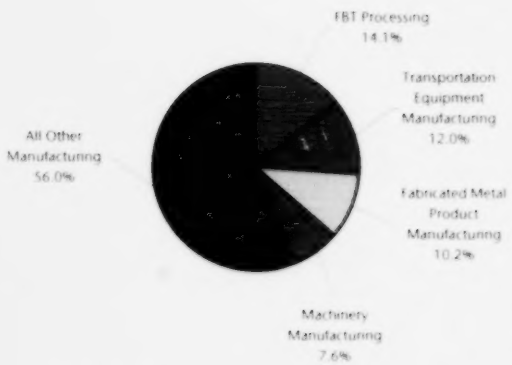


Source: Statistics Canada

- **FBT processing is the largest manufacturing employer,** and accounted for about 14% of total manufacturing employment in 2005.

Chart C3.3

Distribution of Total Manufacturing Employment by Sector, 2005



Source: Statistics Canada

FBT output continues to grow, but at a slower rate than before

- **The total value of FBT processing shipments in 2006 was $72.4 billion (1997 dollars).**

  FBT processing shipments have increased by $17.4 billion since the early 1990s.

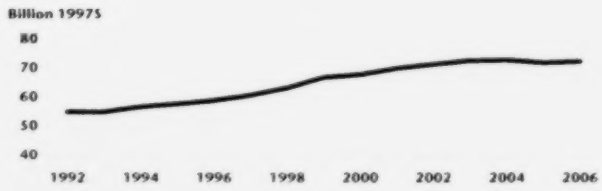
  FBT processing is the largest manufacturing industry in seven provinces, the second largest in Ontario and British Columbia and the third largest in Alberta.

- **The largest FBT processing industry is meat product processing, followed by dairy product processing and beverage processing.**

  Meat and dairy product processing together account for about 40% of the value of FBT shipments.

Chart C3.4

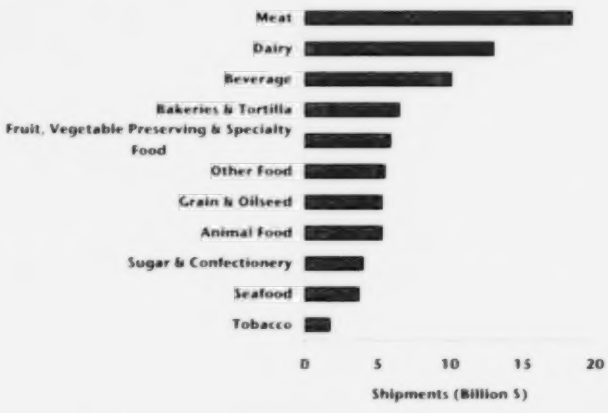
Value of FBT Processing Shipments, 1992-2006



Source: Statistics Canada

Chart C3.5

Value of FBT Processing Shipments, 2006



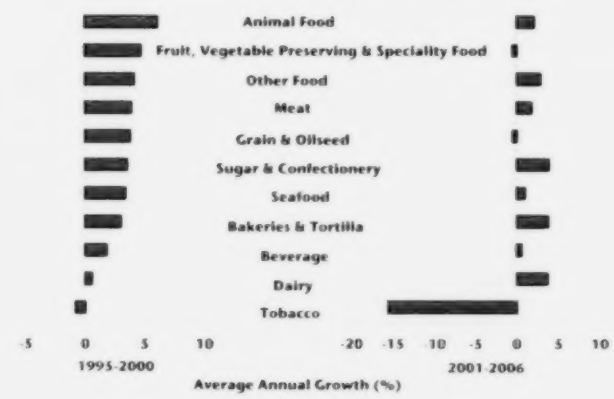
Source: Statistics Canada

- **Most food processing industries have experienced a slowdown in growth relative to the late 1990s.** Notable exceptions are sugar and confectionery, dairy processing, and bakeries and tortilla industries.

  Some industries, such as grains and oilseeds; any fruit, and vegetable preserving and specialty food, have experienced slightly negative growth in recent years, while tobacco has shrunk significantly due to a major reduction in smoking rates.

Chart C3.6

Growth in Shipment Value in Real Dollars by FBT Processing Industry, 1995-2006



Source: Statistics Canada and AAFC calculations

Large food processing firms account for half of the FBT output

- **In 2005 there were 3,347 FBT processing establishments across Canada,** each producing at least $23,000 in sales.
- **Large FBT processing establishments (with 200 or more employees) produce the bulk of output.** In 2005, they comprised only 10% of the total number of establishments but accounted for 54% of the value of shipments.

  In contrast, small establishments (with less than 50 employees) comprised 70% of the total number of establishments but accounted for only 15% of the total value of shipments.

Chart C3.7

Distribution of FBT Processing Shipments and Number of Establishments by Employment Size, 2005 *

Source: Statistics Canada
Note: * This is not comparable to previous information due to changes in definitions

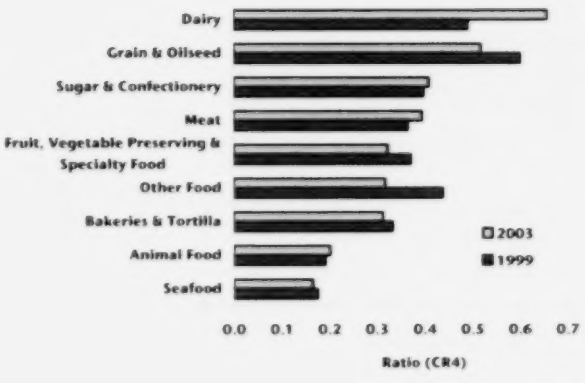
- **Concentration ratios in the food processing industry have been declining with the exception of meat, dairy, and sugar and confectionery industries.**

  Those industries that have experienced rising concentration ratios have also seen an increase in the number of mergers and acquisitions by foreign multinationals in the last ten years, such as in the meat and dairy industries.

  On the other hand, those industries that have experienced declining concentration ratios, such as grains and oilseeds, have seen an increase in the number of players and new entrants.

Chart C3.8

Share of Industry Shipments Accounted for by the Four Largest Firms (CR4), 1999 and 2003



Source: Statistics Canada

Price margins between farm, processing and retail are affected by several market factors and the extent of trade

- **Increases in concentration ratios do not necessarily mean increases in price margins.**

  In the case of red meat rendering and processing, the market share of the top four firms increased from 28% to 32% in Canada between 1999 and 2003.

  At the same time, wholesale to farm price spreads for beef products increased from around $0.85/kg in 1999 to about $1.10/kg in 2003 when the BSE disrupted domestic markets. According to Larue and Gervais (2005), the retail price has grown at a faster pace than the farm price.

  In the case of grain and oilseed milling, the market share of the top four firms decreased from 60% to 52% in Canada between 1999 and 2003. At the same time, the price spread between wheat and flour remained relatively stable.

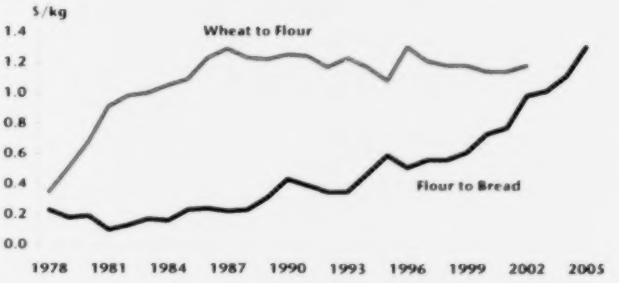
Chart C3.9

Price Margins Between Food Processing and Farm Level and Food Retailing, Beef, 1979-2003

Source: Statistics Canada.

Chart C3.10

Price Margins Between Food Processing and Farm Level and Food Retailing, Wheat, 1979-2005



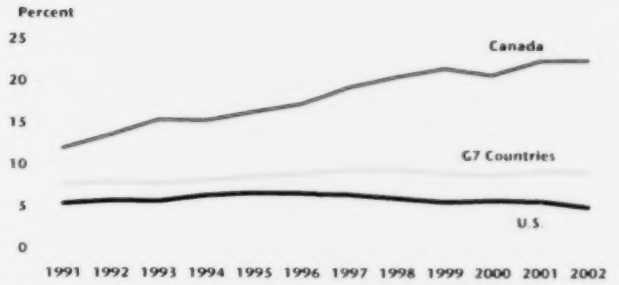
Source: Statistics Canada.

- **The effect of market concentration on price spreads is reduced with trade.**

  Compared to the U.S. and G7 countries, the Canadian food processing sector is more export-oriented, with 23% of production exported in 2002 relative to 5% in the U.S.

Chart C3.11

Export Intensity in FBT Processing, OECD Countries, 1991-2002



Source: OECD.

Some food processing sub-industries are more dependent on trade

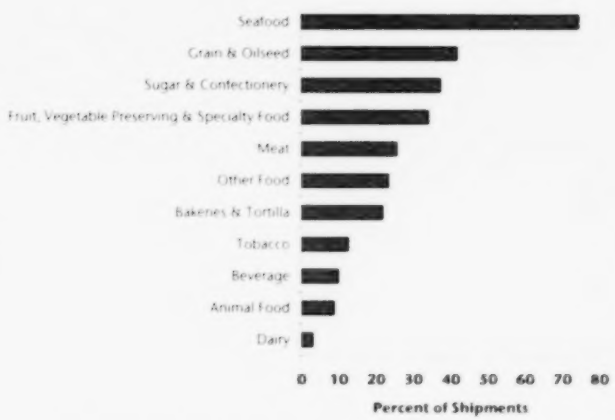
- **About three-quarters of all FBT processing shipments in Canada are destined for the domestic market and the rest are exported.**

  However, some sub-sectors are more export-oriented than others. For example, almost three-quarters of seafood products are exported.

  In 2006, Canadian processed food products were exported to 187 countries, with 78% of the total going to just two markets – the U.S. (70%) and Japan (8%).

Chart C3.12

FBT Processing Export Intensities, by Sub-industry, 2006



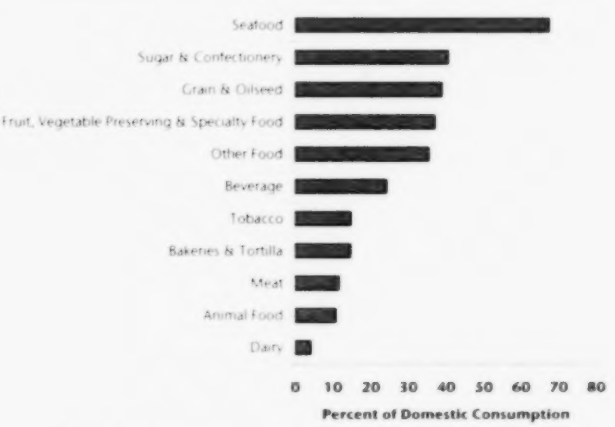
Source: Statistics Canada and AAFC calculations

- **FBT processors compete with imports for domestic sales.** On average, FBT product imports accounted for 22% of the domestic market in 2006.

  In general, the sub-sectors with the highest and lowest export intensities also have the highest and lowest import intensities respectively.

Chart C3.13

FBT Processing Import Intensities, by Sub-industry, 2006



Source: Statistics Canada and AAFC calculations

Profit margins in food processing have remained stable over time

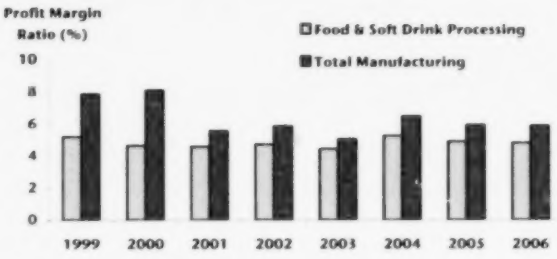
- **Restructuring in the food and non-alcoholic beverage industry to meet current challenges has allowed profit margins in the industry to remain stable but below total manufacturing.**

  These stable profit margins reflect relatively flat revenue growth and modest input price increases.

  The recent appreciating exchange rate has, no doubt, negatively affected profitability of the industry.

Chart C3.14

Profit Margin Ratio in Food and Total Manufacturing, 1999-2006



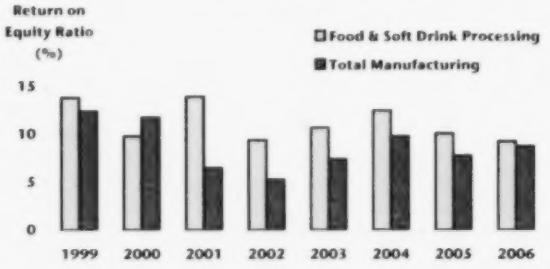
Source: Statistics Canada.

Note: See glossary for definition of the profit margin ratio.

- **Whereas profit margins remain relatively stable, return on equity which measures the return to owners, decreased from about 14% in 1999 to 9.3% in 2006.**

Chart C3.15

Return on Equity Ratio in Food and Total Manufacturing, 1999-2006



Source: Statistics Canada.

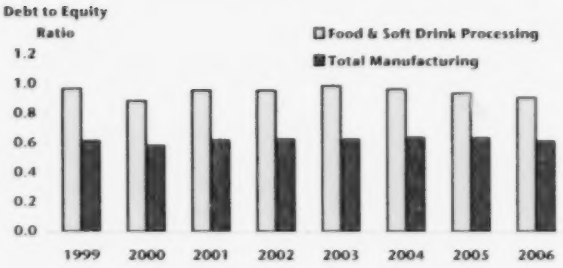
Note: See glossary for definition of the return on equity ratio.

- **The increasing debt levels in the food and non-alcoholic beverage industry are also a challenge for continued profitability and sustainability.**

  The industry-wide debt to equity ratio has remained relatively stable but on average, has been consistently higher than the average for total manufacturing over the past few years.

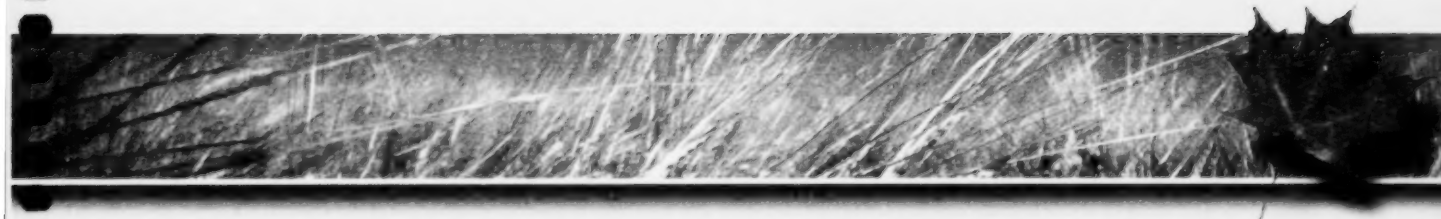
Chart C3.16

Debt to Equity Ratio in Food and Total Manufacturing, 1999-2006



Source: Statistics Canada.

Note: See glossary for definition of the debt to equity ratio.



SECTION C4

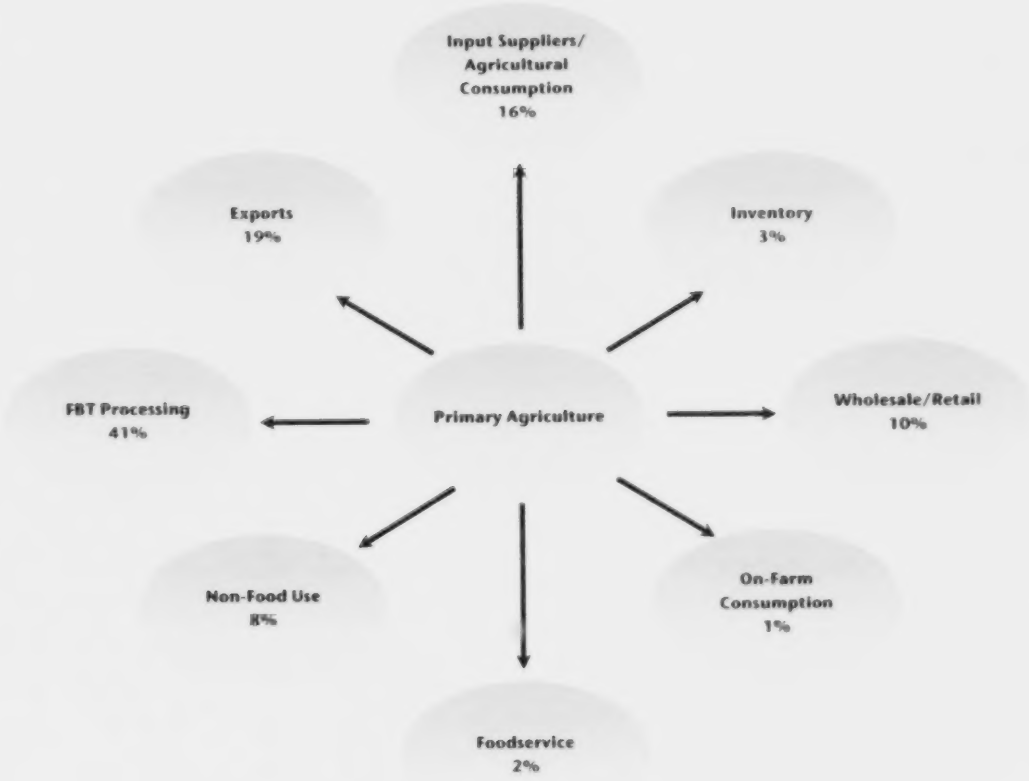
Primary Agriculture

Agricultural producers have direct links to other stages in the supply chain and production is becoming increasingly integrated. Hence, the developments in commodity markets, such as production and price trends, have impacts on the performance of primary agriculture and throughout the supply chain. At the disaggregated level, farms are diverse with different business strategies and management skills and also differ by typology, scale and farm type. This diversity explains the differences in performance between farms.

Agricultural producers have direct links to all stages in the supply chain, so developments in commodity markets have an impact throughout the supply chain

- Agricultural producers have many alternative marketing choices. In 2003, 19% of farm production was exported directly, 41% went to food processing (some of which was also exported), 10% to food distribution and another 16% was consumed within primary agriculture.

Chart C4.1
Disposition of the Value of Agricultural Production, 2003



Source: Statistics Canada Input/Output Model and AAFC calculations.

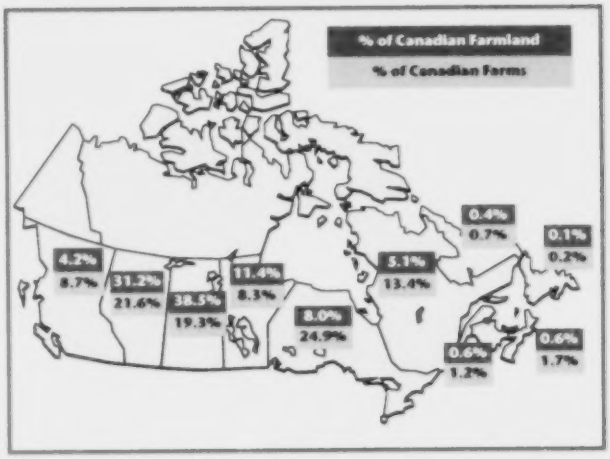
Production is very diverse across provinces of Canada

- **In 2006 there were 167 million acres of farmland in use across Canada.**

The prairie provinces account for 135 million acres or roughly 81% of total farmland. British Columbia, Ontario and Quebec account for another 29 million acres or 17%. The remaining 2% of farmland is located in Atlantic Canada.

However, most farms are located in Ontario, Alberta and Saskatchewan.

Chart C4.2
Provincial Shares of Farmland and Farms, 2006



Source: Statistics Canada, 2006 Census of Agriculture.

- **Farm size varies across Canada depending in large part on commodity specialization and geographic characteristics of regions.**

The average farm size in Ontario, where farming is more intensive, is around 230 acres. The average farm size in Saskatchewan, where farming is more extensive, is nearly six times this size or 1,450 acres.

There are more farm operators than there are farms because of partnerships and other joint ownership arrangements.

Chart C4.3
Number and Size of Farms, 2006

	Farmland (Thousands Acres)	Farms (#)	Average Farm Size (Acres)	Farm Operators (#)	Farm Employment (#)
Canada	**167,010**	**229,373**	**728**	**327,055**	**304,600**
N.L.	89	558	160	715	1,700
P.E.I.	620	1,700	365	2,335	3,700
N.S.	996	3,795	262	5,095	4,300
N.B.	977	2,776	352	3,695	5,800
Que.	8,557	30,675	279	45,470	61,900
Ont.	13,310	57,211	233	82,410	88,000
Man.	19,073	19,054	1,001	26,620	25,500
Sask.	64,254	44,329	1,449	59,185	41,800
Alta.	52,128	49,431	1,055	71,660	41,200
B.C.	7,007	19,844	353	29,870	30,500

Source: Statistics Canada, 2006 Census of Agriculture.

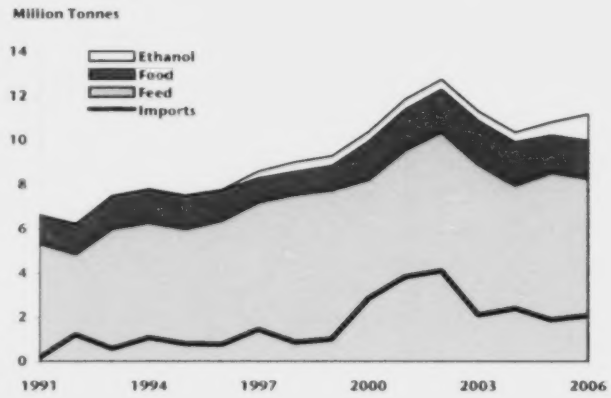
Note: Farm operators are those who are involved in the day-to-day operation of a farm. Employment is recorded by major work activity. Thus, if a farm operator relies on off-farm work for a significant portion of his/her income, he/she is not considered to be in farm employment.

Commodity markets have been affected by the increase in demand for grain for ethanol production, which has contributed to rising grain prices over the past year

- **Total Canadian corn demand increased by 13% in 2006.**

  Most of the increase in corn demand was for ethanol production. Demand for corn for ethanol production is estimated to have increased from 400,000 tonnes in 2005 to one million tonnes in 2006. Part of this increasing domestic demand was satisfied with higher corn imports.

Chart C4.4
Corn Consumption and Imports, 1991-2006

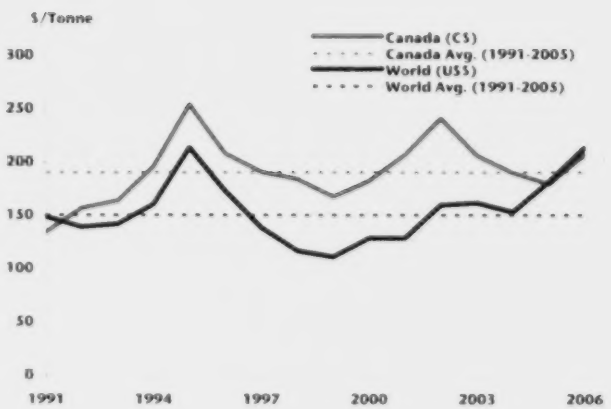


Source: AAFC

- **World prices have been much higher than the historical average in 2006. Canadian prices did not increase as much because of the appreciation of the Canadian dollar.**

  Wheat prices in Canada increased by 17% in 2006, but were still well below the record 1995 level. Feedgrain price increases have been even more significant at 45% in Canada and 50% for the world average in 2006. These are also well below the record 1995 levels.

Chart C4.5
Canadian and World Wheat Prices, 1991-2006



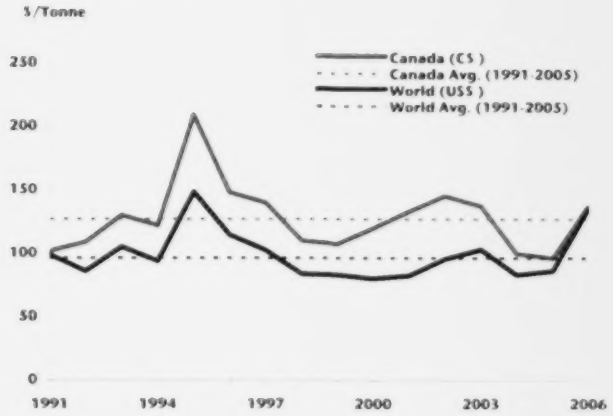
Source: AAFC

This report was prepared before annual or crop year prices for 2007 were available and so price developments during 2007 are not reported here. During 2007 as an example, wheat prices rose significantly to reach over $300/tonne.

Feedgrain and oilseed prices were also affected by the world demand for biofuels

- **World feedgrain prices increased faster than those of Canada in 2006.**

Chart C4.6
Canadian and World Feed Grain Prices, 1991-2006



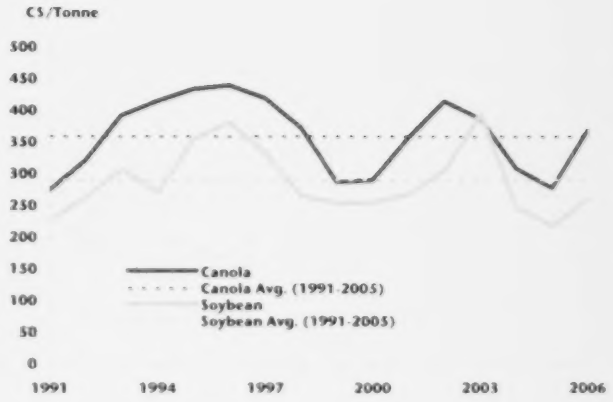
Source: AAFC

- **Oilseed prices fell to their lowest levels in 2005 since 1991, but increased in 2006.**

Prices of canola and soybeans in Canada remained below their historical averages in 2006.

The negative effect of a stronger Canadian dollar on oilseed prices is mitigated to some extent by the higher world price of vegetable oil.

Chart C4.7
Canadian Canola and Soybean Prices, 1991-2006



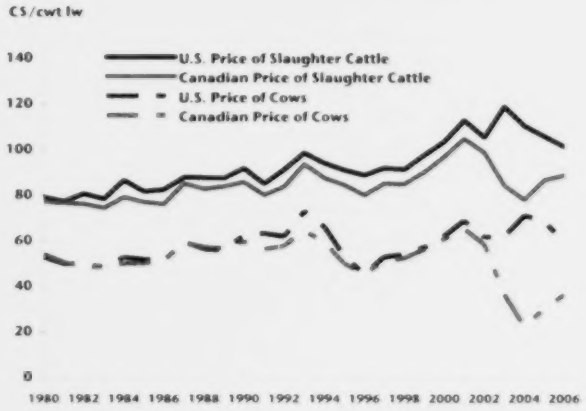
Source: AAFC

Increasing feedgrain prices will affect the cattle market as well

- **Livestock prices show an increasing trend.**

  Cattle prices (excluding the price of cows) in Canada have returned to a more normal basis relative to the U.S. since July 2005 when trade of cattle under 30 months of age was restored. The price of steers in the U.S. remained firm but was affected by the appreciation of the dollar in Canada. The price of feeder steers was negatively affected by the rapid increase in feed prices.

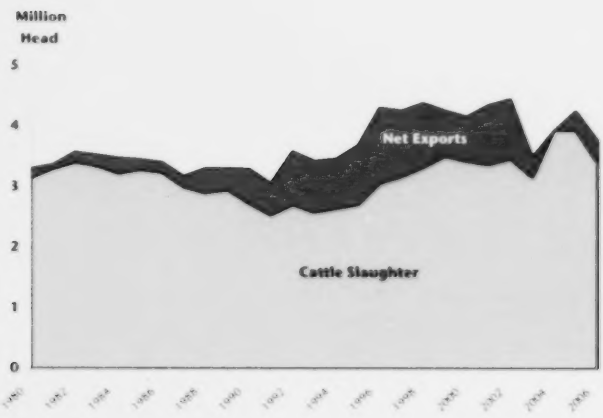
Chart C4.8
The Cattle Price Cycle, 1980-2006



Source: AAFC
Note: lw = liveweight

- **Marketings of slaughter cattle have returned to the pre-BSE level while slaughter has risen above its 2002 level.**

Chart C4.9
Slaughter Cattle Marketing, 1980-2006



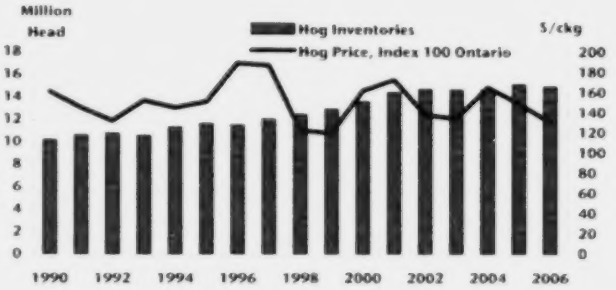
Source: AAFC

The hog and poultry industries are also being impacted by increasing feed prices

- **Relatively low hog prices led to relatively stable hog inventories.**

  Hog inventories have remained relatively stable at just over 14 million head since 2001.

Chart C4.10
Hog Price and Inventories, 1990-2006



Source: AAFC

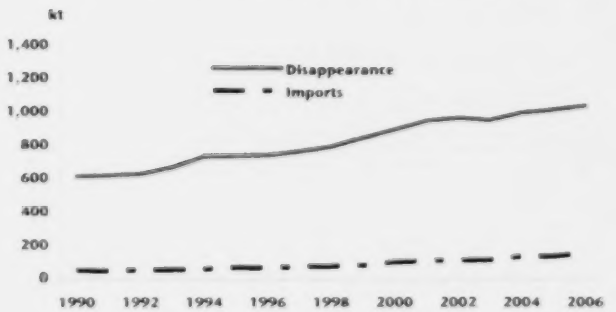
- **Declining hog marketings since 2004 have resulted from lower hog prices in the U.S., accentuated in Canada by the appreciation of the dollar, high feedgrain prices and the post-weaning multi-systemic wasting syndrome (PMWS) that affected the industry in Ontario and Quebec.**

Chart C4.11
Hog Marketings and Margins, 1990-2006

Source: AAFC

- **Chicken disapperance continues to rise over time and has been partly achieved through increased chicken imports.**

Chart C4.12
Chicken Disappearance and Imports, 1990-2006



Source: AAFC

Farm market receipts crept up in 2006 as a result of these commodity market developments

- **Farm market receipts in 2006 were 2.5% higher than the previous five-year average.**

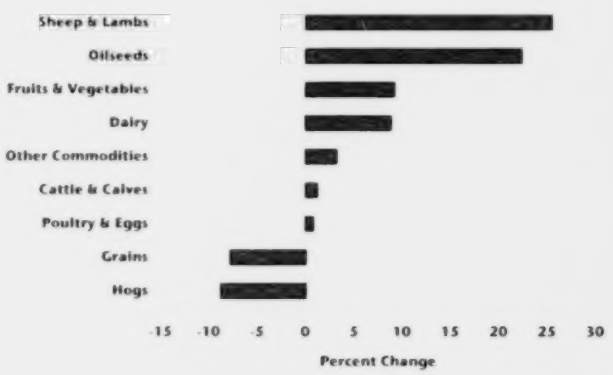
  The cattle and calves industry is gradually recovering after BSE with its market receipts increasing by 1% in 2006 over the previous five-year average.

  Grain and oilseed receipts were down by 8%, partly due to the stronger Canadian dollar.

  Hog market receipts also declined by 9% in 2006 due to lower hog prices.

Chart C4.13

Farm Market Receipts by Commodity, 2006 Relative to Five-Year Average



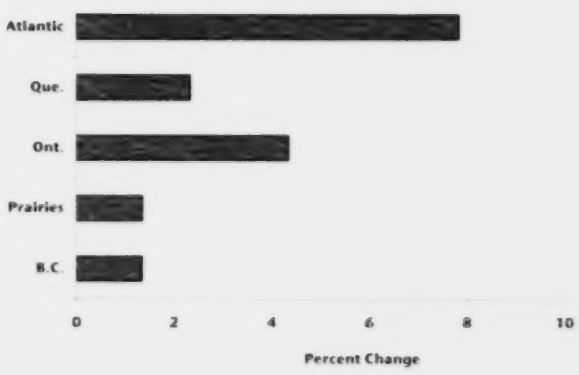
Source: Statistics Canada

- **On a regional basis, Western Canada has experienced slower growth in farm market receipts due to the effects of a strong Canadian dollar on grain prices, and a slower growth in the poultry and egg industry.**

  The Atlantic provinces experienced the most growth in farm market receipts relative to the five-year average.

Chart C4.14

Regional Farm Market Receipts, 2006 Relative to Five Year Average



Source: Statistics Canada

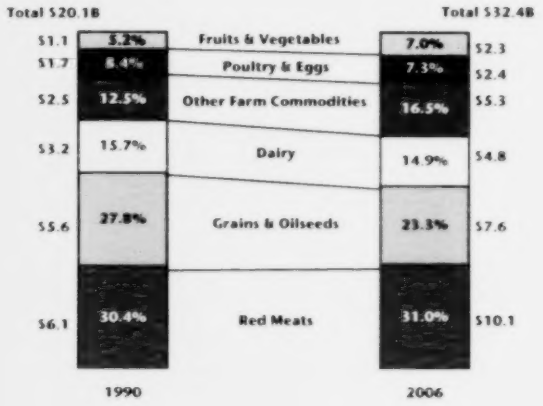
Canada produces a diverse set of commodities and the mix varies across the country

- **The commodity mix is changing as producers are diversifying production.**

  In 2006, red meats, grains and oilseeds, and dairy accounted for almost 70% of total farm market receipts, down from 74% in 1990.

  Since 1990, the contribution of grains and oilseeds, dairy, and poultry and eggs to total farm market receipts are gradually declining, while that of red meats, fruits and vegetables, and other farm commodities are increasing.

Chart C4.15
Farm Market Receipts by Commodity, 1990 and 2006



Source: Statistics Canada

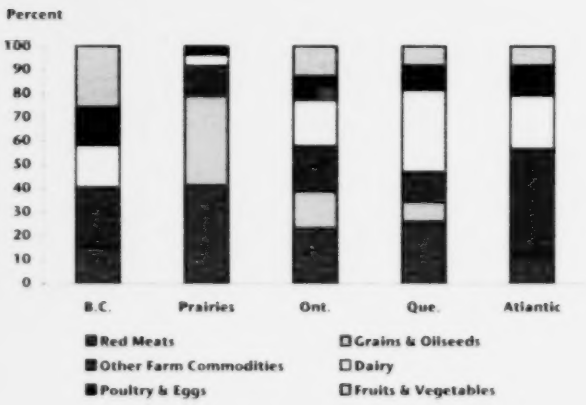
- **Product mix varies by province.**

  In the Prairies, red meats has surpassed grains and oilseeds as the most important commodity.

  In the Atlantic provinces, other farm commodities such as special crops contributed about 50% to farm market receipts in 2006.

  In Central Canada, red meats and dairy are the most important commodities.

Chart C4.16
Regional Farm Market Receipts by Commodity Share, 2006



Source: Statistics Canada

Commodity diversification is particularly evident in the Prairies

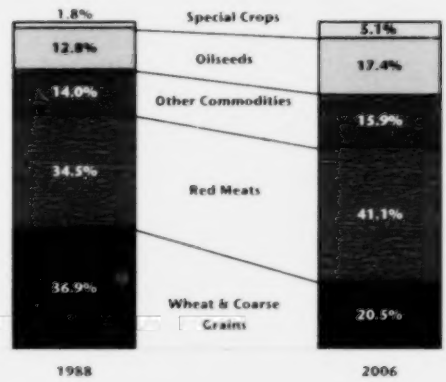
- **In the Prairies, producers are diversifying production from grains to other commodities.**

  The share of market receipts for wheat and coarse grains dropped from 37% in 1988 to 21% in 2006, while the share for red meats and oilseeds increased from 35% to 41% and 13% to 17% respectively during the same period.

  The elimination of the *Western Grain Transportation Act* in 1995 enabled the region to become more competitive in producing hogs and feeding cattle.

Chart C4.17

Evolution of Prairie Farm Market Receipts by Commodity, 1988 and 2006



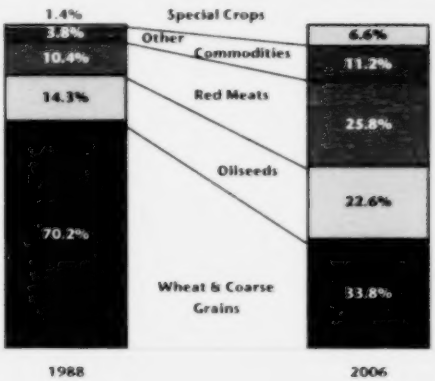
Source: Statistics Canada and AAFC calculations

- **Diversification away from grains has been even more dramatic in terms of commodity export earnings in the Prairies.**

  There has been a notable decline in the share of export earnings from wheat and coarse grains and a steady increase from red meats.

Chart C4.18

Evolution of Prairie Export Earnings by Commodity, 1988 and 2006



Source: Statistics Canada and AAFC calculations

Some sectors are more export oriented than others

- **The grain and oilseed, and red meat industries are very export dependent.**

  In 2005, grain and oilseed, and red meat producers earned 40%, 70% and 56% respectively of their farm cash receipts from export markets. This was an improvement from that of the previous year.

  The red meat industry saw a rebound in export sales from declines in 2003 and 2004 due to BSE.

Chart C4.19
Share of Production from Export Sales

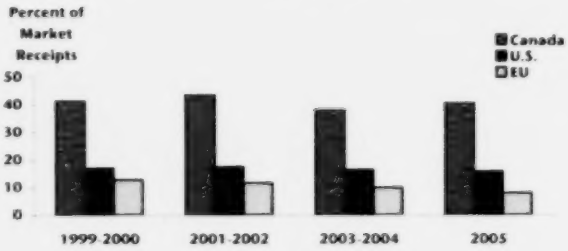
Source: Statistics Canada and AAFC calculations.

Note: Export dependency is calculated in terms of volume to avoid export and farmgate price differentials.
Grain and oilseed export dependency is calculated on a crop year basis and dairy on a dairy year basis.

- **Overall, Canada's agricultural producers are significantly more export oriented than U.S. and EU agricultural producers.**

  About 41% of Canada's agricultural production was exported in 2005 compared to 16% and 8% for the U.S. and EU respectively.

Chart C4.20
Share of Farm Market Receipts from Export Sales for Canada, the U.S. and the EU, 1999-2005



Source: Statistics Canada, OECD and AAFC calculations.

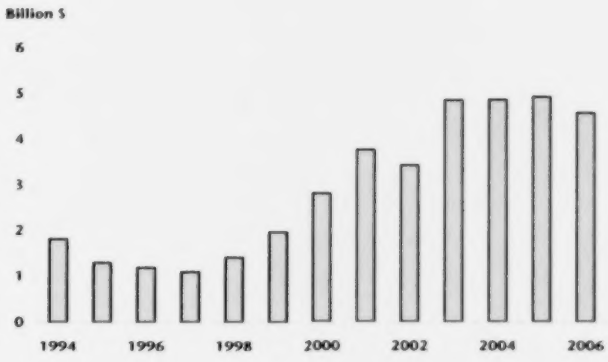
Note: Export dependency is calculated as a value of production weighted average of the export dependencies of the following commodities: wheat, coarse grains, oilseeds, beef, pork, dairy and poultry. These commodities cover about 50% of the EU's total farm production, 60% of the U.S.'s total of the farm production and 75% of Canada's total farm production.

Program payments help to cover low market incomes

- **Program payments are important for farmers' net market losses.**

  Program payments declined from their record level in 2005 to $4.6 billion in 2006.

Chart C4.21
Program Payments, 1994-2006

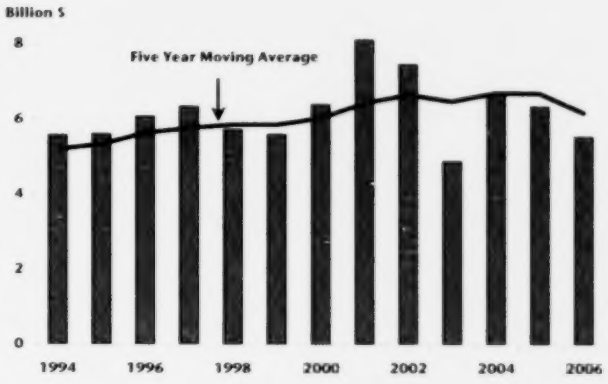


Source: Statistics Canada and AAFC

- **Net cash income for primary agriculture declined in 2006 for the second straight year.**

  Net cash income for primary agriculture was $5.5 billion, a drop of $800 million compared to the year before. However, income situations vary for individual producers, depending on type of commodity, degree of specialization and diversification, size of operation and financial situation.

Chart C4.22
Net Cash Income, 1994-2006



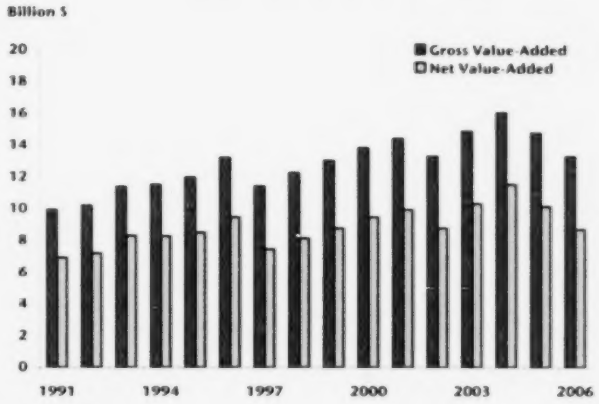
Source: Statistics Canada and AAFC

Value-added in agriculture is increasing

- **Agricultural value-added generally increased over time but showed some signs of decline in 2006.**

  Gross and net value-added in agriculture declined by 10% and 14% respectively in 2006. This can be attributed, in part, to the increasing costs of production and the value of the Canadian dollar.

Chart C4.23
Value-Added in Agriculture, 1991-2006



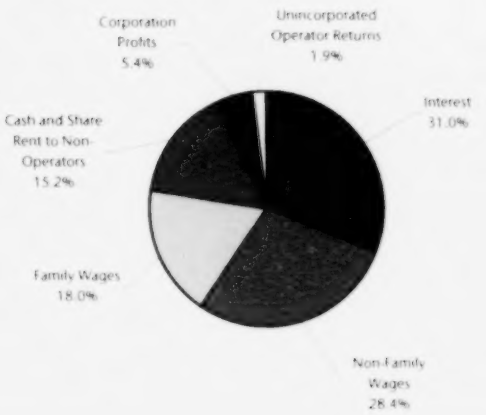
Source: Statistics Canada

- **Interest and wages accounted for about 61% of net value-added in 2005.**

  Corporation profits and unincorporated operator returns accounted for about 27% of net value-added in 2005.

  A sizeable share (12%) of value-added went to non-operator landowners.

Chart C4.24
Distribution of Net Value-Added, 2006



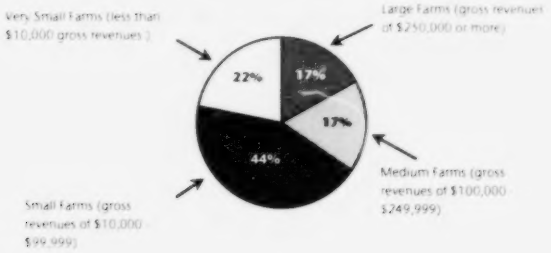
Source: Statistics Canada

Large farms account for the vast majority of production

- **While only 17% of census farms are large (sales of $250,000 and over), they account for 75% of farm production and receive 59% of agricultural program payments.**

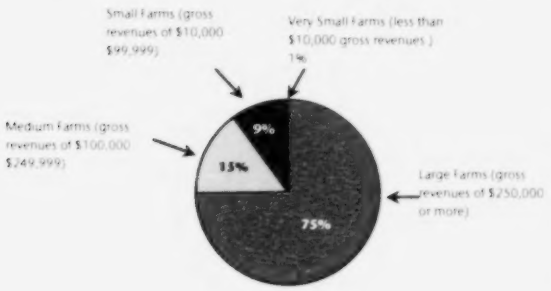
Small and medium-sized farms make up 61% of all farms in Canada, but account for only 24% of production and receive almost all of the remaining 41% of program payments.

Chart C4.25
Distribution of Farms by Farm Size, 2006


Very Small Farms (less than $10,000 gross revenues)
Large Farms (gross revenues of $250,000 or more)
22%
17%
17%
44%
Medium Farms (gross revenues of $100,000 - $249,999)
Small Farms (gross revenues of $10,000 - $99,999)

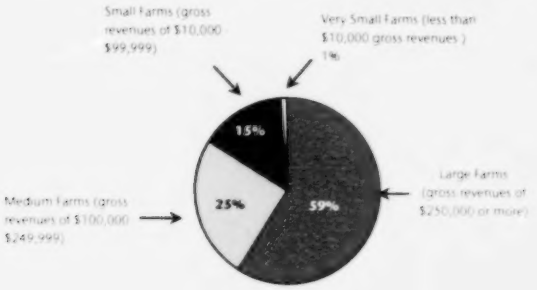
Source: Statistics Canada, 2006 Census of Agriculture and AAFC estimations.

Distribution of Gross Farm Receipts by Farm Size, 2006


Small Farms (gross revenues of $10,000 - $99,999)
Very Small Farms (less than $10,000 gross revenues)
1%
Medium Farms (gross revenues of $100,000 - $249,999)
9%
15%
Large Farms (gross revenues of $250,000 or more)
75%

Source: Statistics Canada, 2006 Census of Agriculture and AAFC estimations.

Distribution of Direct Program Payments by Farm Size, 2006


Small Farms (gross revenues of $10,000 - $99,999)
Very Small Farms (less than $10,000 gross revenues)
1%
15%
Medium Farms (gross revenues of $100,000 - $249,999)
25%
59%
Large Farms (gross revenues of $250,000 or more)

Source: Statistics Canada, 2006 Census of Agriculture and AAFC estimations.

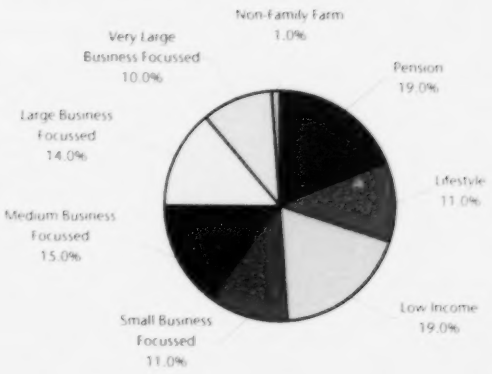
Different people farm for different reasons

Farms and farm families can be classified based on the farm operator age, focus and financial situation.

- About one-third of farms are either retirement or lifestyle farms.
- Another 19% are low income farms, with total family income of less than $35,000.
- The remaining farms can be categorized according to their scale of operation, ranging from small to very large business-focussed farms.
- Only a few farms are non-family farm operations.

Chart C4.26

Distribution of Farms with $10,000 or more in Gross Farm Receipts by Typology Group, 2005



Source: Statistics Canada and AAFC, 2006 Farm Financial Survey

Typology	Definitions
Small Family Farms (gross revenues of $10,000 - $249,999)	
Pension	Farms whose operators are 65 and over, and those 60 to 64 receiving pension income. Multi-generational farms are excluded.
Lifestyle	Farm families operating with gross farm revenues of $10,000 to $49,999, and whose farm family earn $50,000 or more from non-farm sources of income.
Low Income	Farm families earning less than $35,000 in total family income.
Business Focussed	Farms with $10,000 to $249,999 in gross revenues that do not fall in any of three previous categories.
Small Business Focussed	Farms with gross revenues of $10,000 to $99,999.
Medium Business Focussed	Farms with gross revenues of $100,000 to $249,999.
Large-scale Family Farms (gross revenues of $250,000 or more)	
Large Business Focussed	Farms with gross revenues of $250,000 to $499,999.
Very Large Business Focussed	Farms with gross revenues of $500,000 or more.
Non-family Farms	**Farms organized as non-family corporations, cooperatives or communal operations. Also includes farms held in estates or trusts.**

Note: Typology definitions have changed from previous years and are not directly comparable.

Hobby farms, those with less than $10,000 in gross revenues, are not included in this breakdown.

Different people farm with different business goals

- **The primary business goals of producers vary.**

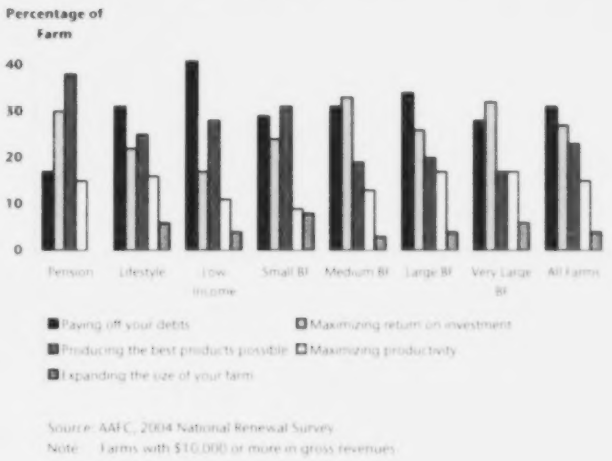
  According to a 2004 National Renewal Survey, paying off debts was reported as the most important farm business goal by the lifestyle, low income and large business-focussed groups.

  For the medium and very-large business-focussed groups, maximizing return on investment was considered the most important business goal.

  Producing the best products possible was reported as the most important business goal of the retirement and small business-focussed groups.

Chart C4.27

Farm Business Goals of Canadian Operators Ranked as Their Most Important, 2004



Source: AAFC, 2004 National Renewal Survey
Note: Farms with $10,000 or more in gross revenues

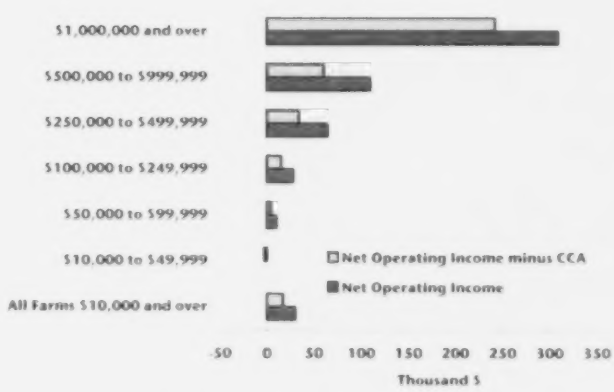
- **Average net operating income (gross farm revenues less total operating expenses) was $30,050 per farm in 2005. Adjusting for capital cost allowance (CCA), a measure of depreciation, reduced farm income to $17,189 per farm.**

  Average net operating income varied from $89 for the smallest farms, to over $300,000 for farms which generate gross farm revenues of one million dollars or more in 2005.

  CCA or depreciation expense reduced net operating income by approximately 50% for most revenue classes. CCA had much less of an impact on the $1 million farm operations compared to other smaller farm operations.

Chart C4.28

Average Farm Net Operating Income by Revenue Class, 2005



Source: Statistics Canada, Whole Farm Database
Note: Farms with $10,000 or more in gross revenues

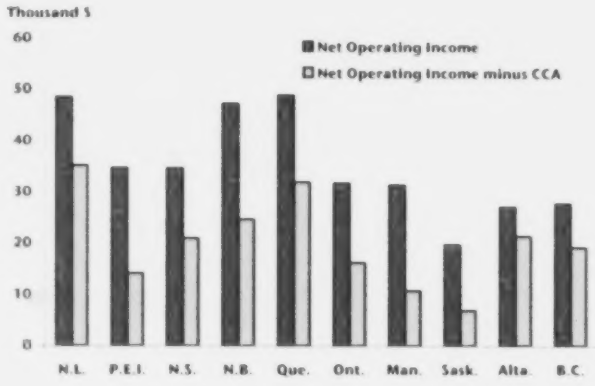
Farm income also varies by province and farm type

- **Quebec and Newfoundland and Labrador reported the highest average farm net operating income.**

  Average farm net operating income ranged from about $20,000 in Saskatchewan to $49,000 in Quebec in 2005.

  Average farm net operating income, when adjusted for CCA, ranged from about $7,000 in Saskatchewan to $35,000 in Newfoundland and Labrador in 2005.

Chart C4.29
Average Farm Net Operating Income by Province, 2005



Source: Statistics Canada, Whole Farm Database.

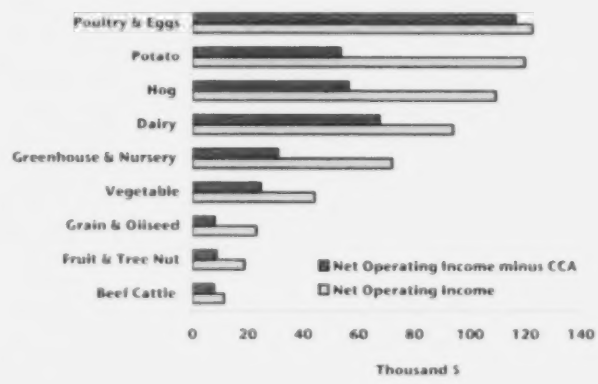
Note: Farms with $10,000 or more in gross revenues.

- **On average, poultry and egg farms, potato farms and hog farms had the highest net operating incomes in 2005.**

  Average farm net operating income for potato farms was, however, reduced significantly when adjusted for CCA from about $120,000 to $53,000.

  Beef cattle farms reported the lowest net operating income in 2005.

Chart C4.30
Average Farm Net Operating Income by Farm Type, 2005



Source: Statistics Canada, Whole Farm Database.

Note: Farms with $10,000 or more in gross revenues.

The importance of off-farm income to total operator income also varies by province and farm type

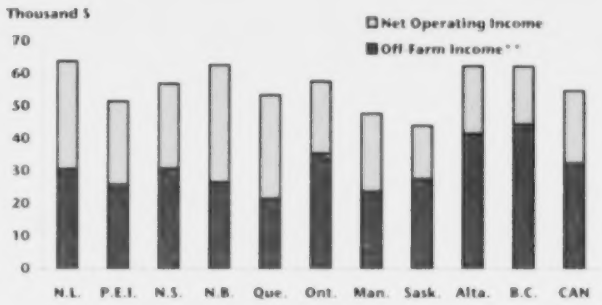
- **In 2005, the average income earned by farm operators was $54,700, with 60% of income derived from off-farm sources.**

  Operators in Newfoundland and Labrador, New Brunswick, Alberta and British Columbia reported average incomes above $60,000, while Manitoba and Saskatchewan reported the lowest incomes.

  With the exception of Newfoundland and Labrador, New Brunswick and Quebec, off-farm income accounted for a greater proportion of total income of farm operators in all provinces.

Chart C4.31

Average Farm* Operator Income by Income Source and Province, 2005



Source: Statistics Canada, Whole Farm Database

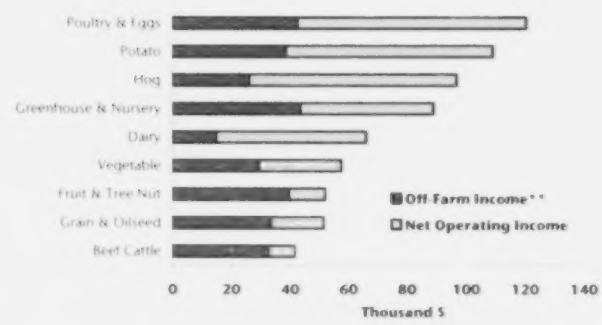
Note: *Farms with $10,000 or more in gross revenues.
**Includes wages and salaries (farm and non-farm), net non-farm self-employment income, investment income, pension income, and other off-farm income, but excludes taxable capital gains.

- **In 2005, poultry and egg, and potato farm operators reported average incomes of over $100,000 with about 37% from off-farm sources.**

  On the other hand, farm operators operating beef enterprises reported the lowest income at $41,600 with about 75% from off-farm sources.

Chart C4.32

Average Farm* Operator Income by Income Source and Farm Type, 2005



Source: Statistics Canada, Whole Farm Database

Note: *Farms with $10,000 or more in gross revenues.
**Includes wages and salaries (farm and non-farm), net non-farm self-employment income, investment income, pension income, and other off-farm income, but excludes taxable capital gains.

Farm income varies by typology within the same revenue class

- **On average, farms in the low income and lifestyle groups reported negative net operating income in 2005 while all other farm types reported positive net operating income.**

Chart C4.33
Farm Typology Data, 2005

Revenue Class	Typology	Number of Farms	Gross Farm Revenue* (A)	Total Operating Expenses (B)	Family Share of GVT Payments** (C)	Family Share of Net Market Income*** (D)	Farm Wages and Salaries (E)	Off Farm Income (F)	Total Family Income (G=C+D+E+F)
Small Family Farms (gross revenues of $10,000 - $249,999)	Pension	27,596	58,161	51,787	6,953	-784	1,546	35,506	43,221
	Lifestyle	15,637	25,390	30,891	2,821	-8,285	746	98,824	94,106
	Low Income	28,406	78,152	88,340	9,698	-19,863	2,142	15,094	7,070
	Small Business Focussed	16,541	61,309	50,170	9,041	1,839	1,884	61,575	74,340
	Medium Business Focussed	22,587	166,108	125,979	18,512	20,622	7,378	42,215	88,728
	Total	**110,767**	**81,144**	**73,099**	**9,743**	**-1,979**	**2,825**	**44,471**	**55,060**
Large-scale Family Farms (gross revenues of $250,000 or more)	Large Business Focussed	20,617	343,186	290,036	31,433	18,464	15,281	29,864	95,042
	Very Large Business Focussed	14,531	1,176,441	998,962	53,974	103,642	41,610	40,088	239,315
	Total	**35,147**	**687,675**	**583,124**	**40,752**	**53,679**	**26,166**	**34,091**	**154,688**

Source: Statistics Canada and AAFC, 2006 Farm Financial Survey.

Note: * Gross farm revenue includes government payments.

** Household share is based on an individual's or family's percent ownership of the farm.

*** Excludes communal operations.

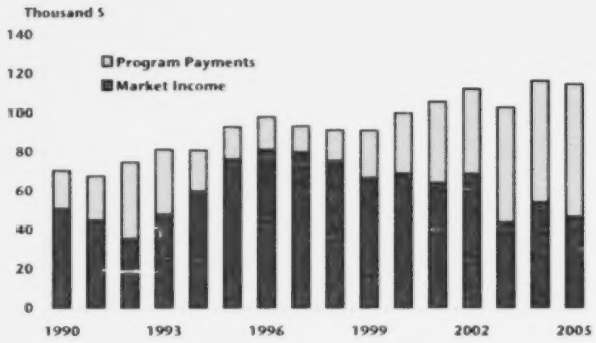
Farm operating income of large farms has increased with program payments making up for short falls in market revenue

- **Net farm operating income increased from $71,000 to $115,000 for farms with gross farm revenues of $250,000 or more between 1990 and 2005.**

  However, market income of this revenue class has fluctuated and declined to about $47,000 in 2005 from a high of about $81,000 in 1996.

Chart C4.34

Average Market Income and Program Payments for Farms with Gross Revenues of $250,000 and over, 1990 to 2005



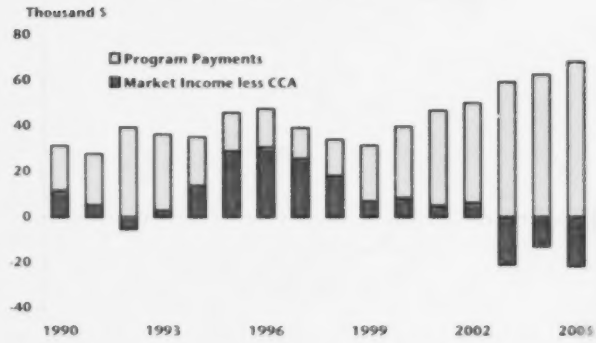
Source: Statistics Canada, Whole Farm Database

- **Program payments are helping to maintain the long term viablity of the farm sector.**

  Program payments received by farm operators with revenue of $250,000 or more, tripled between 1995 and 2005.

Chart C4.35

Average Market Income less CCA and Program Payments for Farms with Gross Revenues of $250,000 and over, 1990-2005



Source: Statistics Canada, Whole Farm Database

Farm financial performance depends on the management skills of farmers, and varies even within a revenue class

- **Financial performance varies among farm operators, even among producers operating the same size farm with the same commodity specialization.** These variations in performance have been consistent over time.

High performance farms are consistently profitable, regardless of market conditions with almost half of their income coming from the market.

The low performance farms consistently lose money on their operations, and rely heavily on large program payments.

Chart C4.36

Net Income of Saskatchewan Grain & Oilseed Farms, $250,000 to $500,000 Revenue Class, 2001-2005

Source: NISA/CAIS Database and AAFC calculations.

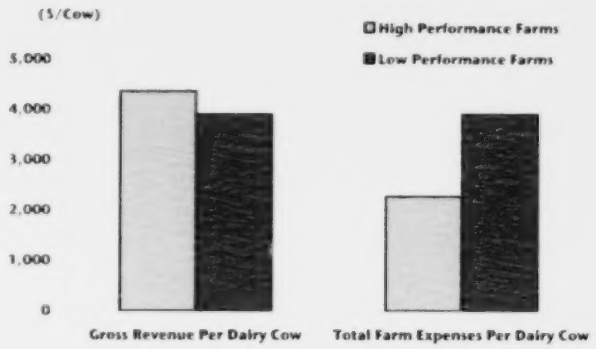
Note: Farms were ranked according to their average net income over the five-year period. The three groups on which the chart is based were drawn from this average ranking. Data for the individual producers in each sample were then collated for each of the five years.

Cost control is particularly important to farm financial performance and varies even within a revenue class

- **High performance farms maximize revenues and at the same time control costs.**

  For example high performance dairy farms had higher revenues per head and lower expenses than low performance dairy farms.

Chart C4.37
Revenue and Expenses for Dairy Farms, 2005

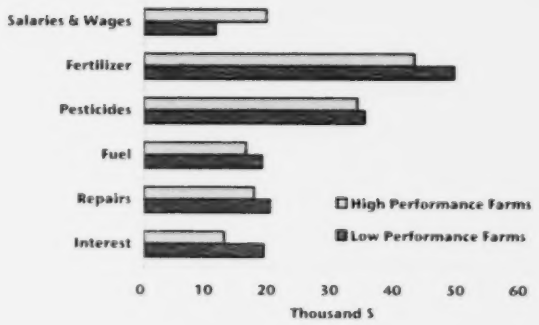


Source: Statistics Canada and AAFC, 2006 Farm Financial Survey.
Note: High and low performance farms represent the top and bottom 20% of farms respectively, based on operating margin.
Farms with $10,000 or more in gross revenues.

- **Cost control tends to reduce all types of farm expenses.**

  The high performance farms reported lower average expenses than low performance farms in all farm expense categories, with the exception of wages and salaries.

Chart C4.38
Selected Average Expenses of Saskatchewan Grain & Oilseed Farms, $250,000 to $500,000 Sales Class, 2001 - 2005

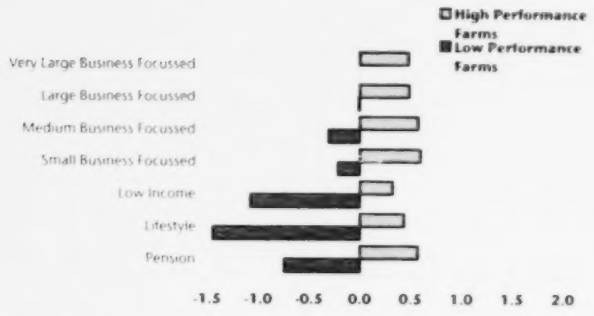


Source: NISA/CAIS Database and AAFC calculations.
Note: High and low performance farms represent the top and bottom 20% of farms respectively.

Farm size is not a limiting factor in financial performance

- **High performance farms, in different farm typologies, generate comparable gross margin ratios.**

Chart C4.39
Gross Margin Ratios Reported by High and Low Performance Farms by Typology, 2005



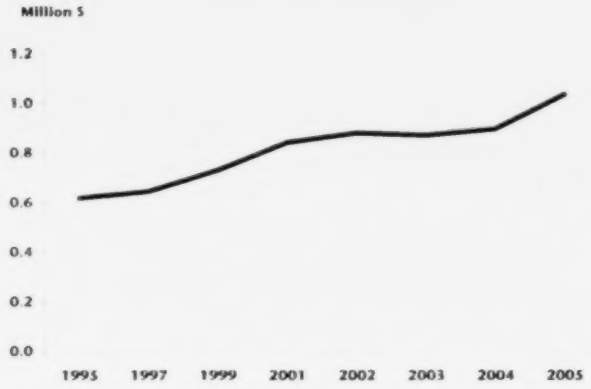
Source: Statistics Canada and AAFC, 2006 Farm Financial Survey.
Note: Farms with $10,000 or more in gross revenues.
Gross margin ratios are calculated as the ratio of net operating income to gross farm revenues.
High and low performance farms are the top and bottom 20% of farms respectively based on operating margin.

The financial situation of farms takes into account both income and net worth measures

- **Farm net worth continued to increase over the last few years after a slight decline in 2003.**

  In 2005 the average farm net worth was $1,035,950 up 15% from 2004.

Chart C4.40
Average Farm Total Net Worth, 1995-2005

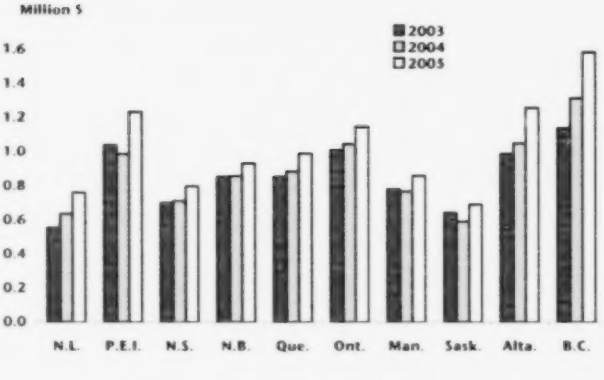


Source: Statistics Canada and AAFC, Farm Financial Survey, various years.
Note: Farms with $10,000 or more in gross revenues.

- **All provinces showed an increase in average net worth in 2005 compared to 2004.**

  Average net worth increased faster in British Columbia than in any other province, partly due to the increasing land values in British Columbia.

Chart C4.41
Average Farm Total Net Worth by Province, 2003-2005



Source: Statistics Canada and AAFC, Farm Financial Survey, various years.
Note: Farms with $10,000 or more in gross revenues.

Farm net worth also varies by farm type

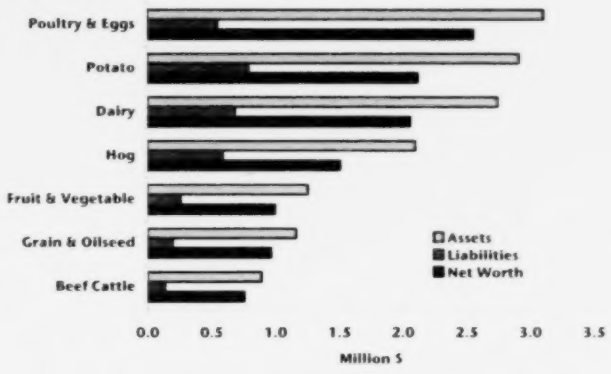
- **On average, poultry, dairy, potato and hog farms have the highest net worth (ranging from $1.5 to $2.6 million in 2005).**

  Beef farms had the lowest assets, liabilities and net worth, on average.

  On average, potato farms carry the largest debts ($792,200 per farm) followed by dairy, hog, and poultry farms with debts of $684,010, $588,515 and $548,400 respectively.

Chart C4.42

Average Assets, Liabilities and Net Worth by Farm Type, 2005



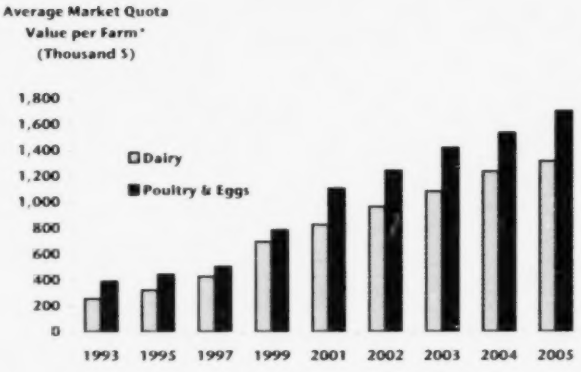
Source: Statistics Canada and AAFC, 2006 Farm Financial Survey.
Note: Farms with $10,000 or more in gross revenues.

- **Quota values in the supply managed industries have grown significantly in recent years.**

  In 2005 the average dairy farm had around $1.3 million worth of quota, and the average poultry farm around $1.7 million, accounting for 48% and 55% of total farm assets respectively. The trend is caused by the increase in the value of quota per animal and the increase in the number of animals per farm.

Chart C4.43

Average Quota Holdings of Supply Managed Farms, 1993-2005



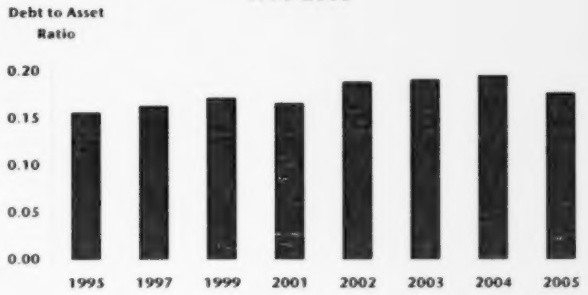
Source: Statistics Canada and AAFC, Farm Financial Survey, various years.
Note: *Farms with $10,000 or more in gross revenues.

Financial stress of farms is affected by both cash flow and debt to asset ratios

- **Overall, the debt to asset ratio for all farms has been relatively stable over time.**

  The debt to asset ratio ranged from 15.5% to 19.4% betwen 1995 and 2005.

Chart C4.44
Debt to Asset Ratios* for Farms, Canada, 1995-2005

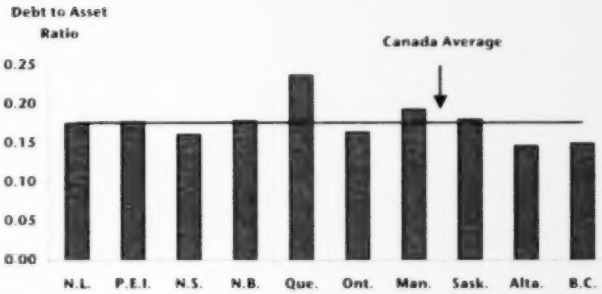


Source: Statistics Canada and AAFC, Farm Financial Survey, various years.
Note: *Average per farm, farms with $10,000 or more in gross revenues.

- **Debt to asset ratios vary by province.**

  Quebec farms had the highest debt to asset ratio (23.6%) because of the predominance of supply managed commodities and hogs. Alberta reported the lowest debt to asset ratio in 2005 (14.5%) which was due to higher asset values.

Chart C4.45
Debt to Asset Ratios* by Province, 2005

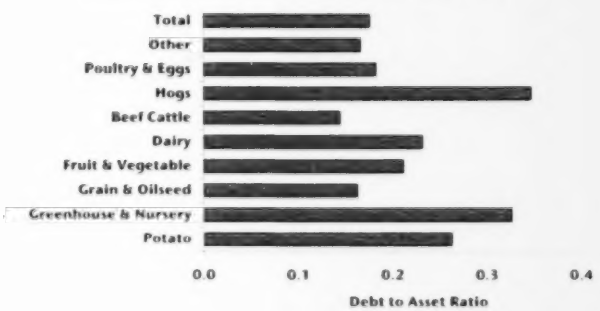


Source: Statistics Canada and AAFC, 2006 Farm Financial Survey.
Note: *Average per farm, farms with $10,000 or more in gross revenues.

- **Debt to asset ratio also varies by farm type.**

  Hog farms and greenhouse and nursery farms reported the highest debt to asset ratios in 2005 of 34.6% and 32.6% respectively.

Chart C4.46
Debt to Asset Ratios* by Farm Type, 2005



Source: Statistics Canada and AAFC, 2006 Farm Financial Survey.
Note: *Average per farm, farms with $10,000 or more in gross revenues.

The vast majority of farms (90.2%) were not under financial stress

- **In 2005, a small percent of farms (7.9%) were under significant financial stress while 1.9% of farms were under moderate financial stress.**

Chart C4.47

Financial Stress*, 2005

Cash Flow Categories	Equity in Percentage			
	Less than 50%	50% to 75%	Greater than 75%	All Net Worth
Less than $20,000	2.9%	4.1%	15.1%	22.2%
$20,000 to $35,000	0.9%	1.9%	10.0%	12.7%
Greater than $35,000	4.5%	13.0%	47.6%	65.1%
All Cashflow	8.3%	19.1%	72.6%	100.0%

Legend: Significant risk
Moderate risk

Source: Statistics Canada and AAFC, 2006 Farm Financial Survey

Note: *Farms with $10,000 or more in gross revenues excluding co-ops and communal operations.

The vast majority of farms (90.2%) were not under financial stress

- **In 2005, a small percent of farms (7.9%) were under significant financial stress while 1.9% of farms were under moderate financial stress.**

Chart C4.47

Financial Stress*, 2005

Cash Flow Categories	Equity in Percentage			
	Less than 50%	50% to 75%	Greater than 75%	All Net Worth
Less than $20,000	2.9%	4.1%	[illegible]	[illegible]
$20,000 to $35,000	0.9%	1.9%	[illegible]	[illegible]
Greater than $35,000	[illegible]	[illegible]	[illegible]	[illegible]
All Cashflow	[illegible]	[illegible]	[illegible]	[illegible]

[illegible]: Legend: Significant risk; Moderate risk

[illegible]: Source: Statistics Canada and AAFC, 2006 Farm Financial Survey

[illegible]: Note: *Farms with $10,000 or more in gross revenues excluding crops and communal operations.

Farm family income, which measures the total income of the farm family, also varies by province and farm type

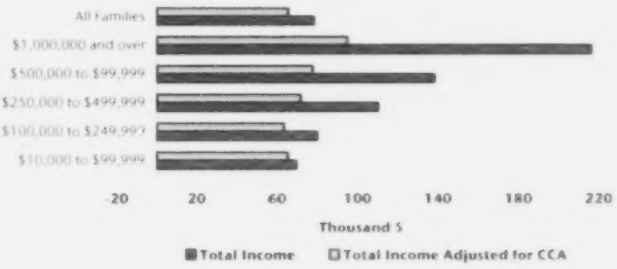
- **Average farm family income for unincorporated farms was $78,252 in 2004. After adjusting for capital cost allowance (CCA), average farm family income was $65,364.**

  Average farm family income varies from $69,500 for families operating farms with gross farm revenue of $10,000-$99,999, to $216,500 for families operating million dollar plus operations.

  Once CCA has been deducted, the differences between revenue classes diminish greatly.

Chart C4.48

Average Farm Family Income by Revenue Class, 2004



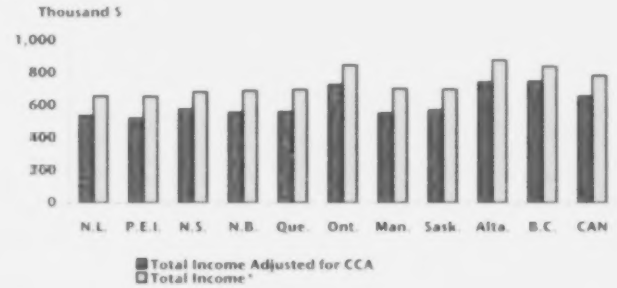
Source: Statistics Canada, Whole Farm Database.
Note: Unincorporated farms with $10,000 or more in gross revenues.
Excludes taxable capital gains.

- **Farm families in Alberta, Ontario and British Columbia, on average, have incomes above the Canadian average.**

  Farm families in P.E.I. earned the lowest income on average in 2004.

Chart C4.49

Average Farm Family Income by Province, 2004



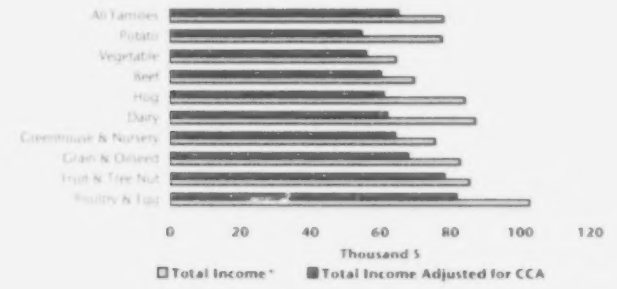
Source: Statistics Canada, Whole Farm Database.
Note: Unincorporated farms with $10,000 or more in gross revenues.
Excludes taxable capital gains.

- **Families operating poultry and egg, fruit and tree nut, and grain and oilseed farms reported average family incomes above the Canadian average in 2004.**

  The impact of CCA varies by farm type. Operations which tend to be more capital intensive, such as dairy, hogs and grain and oilseed farms, deduct more on average for CCA compared to other farm operations.

Chart C4.50

Average Farm Family Income by Farm Type, 2004



Source: Statistics Canada, Whole Farm Database.
Note: Unincorporated farms with $10,000 or more in gross revenues.
Excludes taxable capital gains.

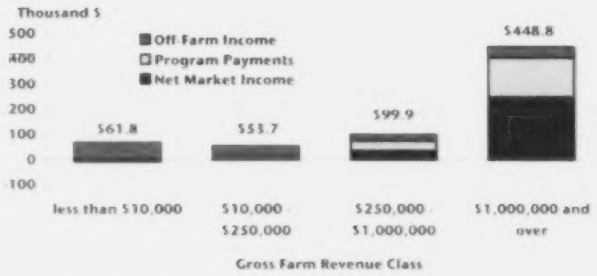
Off-farm income accounts for a significant share of farm family income

- **Families on smaller farms are more dependent on off-farm income.**

For smaller farms, off-farm income along with program payments is enough to offset the negative net market income.

Chart C4.51

Average Income of Farm Families by Source of Income by Four Sales Classes, 2005



Source: Canadian Agriculture Dynamic Micro Simulation Model (CADMS) and AAFC calculations.

Newfoundland and Labrador farm families reported the largest proportion of off-farm income at 91%, followed by British Columbia at 88% and Ontario at 83%.

A considerably smaller proportion of total family income came from off-farm sources for farm families in Quebec and Manitoba at 62% and 69% respectively.

Chart C4.52

Off-Farm Income and Net Operating Income of Farm Families by Province, 2004

	Total Off-Farm Income	Market Income	Program Payments	Off-Farm Income as a Percentage of Total
CANADA	**61,670**	**2,670**	**13,910**	**79%**
N.L.	58,030	1,540	4,130	91%
P.E.I.	52,410	-380	12,340	81%
N.S.	49,390	11,900	6,580	73%
N.B.	49,950	9,610	8,870	73%
Que.	43,200	6,180	20,160	62%
Ont.	69,870	6,650	8,130	83%
Man.	48,670	7,670	13,820	69%
Sask.	56,790	-3,960	16,950	81%
Alta.	72,270	-290	15,700	82%
B.C.	73,430	4,530	5,940	88%

Source: Statistics Canada, Whole Farm Database.

Note: Farms with $10,000 or more in gross revenues.
Excludes taxable capital gains.

- **The proportion of off-farm income to family income also varies by farm type.**

Farm families operating beef farms and fruit and tree nut farms, reported the largest proportion of off-farm income at 89% and 86% respectively. Farm families operating grain and oilseed farms and greenhouse and nursery farms, followed closely behind at 78% each.

A considerably smaller proportion of total family income came from off-farm sources for farm families in dairy farms.

Chart C4.53

Off-Farm Income and Net Operating Income of Farm Families by Farm Type, 2004

	Total Off-Farm Income	Market Income	Program Payments	Off-Farm Income as a Percentage of Total
Grain & Oilseed	64,750	3,450	14,700	78%
Potato	53,555	4,470	19,760	69%
Vegetable & Melon	47,100	10,300	7,350	73%
Fruit & Tree Nut	73,440	6,950	5,160	86%
Greenhouse & Nursery	58,910	12,100	4,770	78%
Beef Cattle	62,250	10,290	17,900	89%
Dairy	28,900	45,710	12,700	33%
Hog	43,960	21,210	19,100	52%
Poultry & Eggs	52,100	40,870	9,750	51%
Other	72,500	-2,900	7,200	94%

Source: Statistics Canada, Whole Farm Database.

Note: Farms with $10,000 or more in gross revenues.
Excludes taxable capital gains.

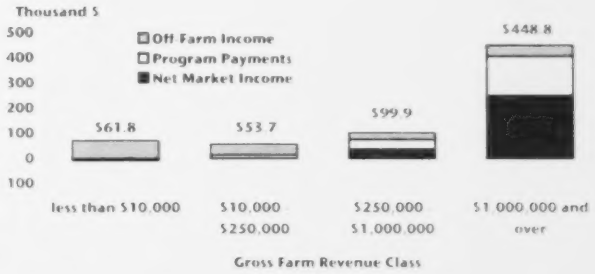
Off-farm income accounts for a significant share of farm family income

- **Families on smaller farms are more dependent on off-farm income.**

For smaller farms, off-farm income along with program payments is enough to offset the negative net market income.

Chart C4.51

Average Income of Farm Families by Source of Income by Four Sales Classes, 2005



Source: Canadian Agriculture Dynamic Micro Simulation Model (CAMSIM) and AAFC calculations

Newfoundland and Labrador farm families reported the largest proportion of off-farm income at 91%, followed by British Columbia at 88% and Ontario at 83%.

A considerably smaller proportion of total family income came from off-farm sources for farm families in Quebec and Manitoba at 62% and 69% respectively.

Chart C4.52

Off-Farm Income and Net Operating Income of Farm Families by Province, 2004

	Total Off-Farm Income	Market Income	Program Payments	Off-Farm Income as a Percentage of Total
CANADA	**61,670**	**2,670**	**13,910**	**79%**
NL	56,030	1,540	4,130	91%
PEI	52,410	180	12,140	81%
NS	49,390	11,900	6,360	70%
NB	49,950	9,610	8,870	73%
Que	43,200	6,780	20,160	62%
Ont	69,870	6,650	8,130	83%
Man	48,670	7,670	13,820	69%
Sask	56,790	5,960	16,950	87%
Alta	72,270	290	15,700	82%
BC	73,430	4,530	5,940	88%

Source: Statistics Canada, Whole Farm Database

Note: Farms with $10,000 or more in gross revenues
Excludes taxable capital gains

- **The proportion of off-farm income to family income also varies by farm type.**

Farm families operating beef farms and fruit and tree nut farms, reported the largest proportion of off-farm income at 89% and 86% respectively. Farm families operating grain and oilseed farms and greenhouse and nursery farms, followed closely behind at 78% each.

A considerably smaller proportion of total family income came from off-farm sources for farm families in dairy farms.

Chart C4.53

Off-Farm Income and Net Operating Income of Farm Families by Farm Type, 2004

	Total Off-Farm Income	Market Income	Program Payments	Off-Farm Income as a Percentage of Total
Grain & Oilseed	64,740	3,450	14,700	78%
Potato	53,555	4,470	19,760	69%
Vegetable & Melon	47,100	10,600	7,340	73%
Fruit & Tree Nut	73,440	6,950	4,130	86%
Greenhouse & Nursery	58,910	12,100	4,770	78%
Beef Cattle	62,210	11,290	17,960	84%
Dairy	75,900	48,770	12,790	53%
Hog	44,960	25,200	15,900	72%
Poultry & Egg	52,300	30,870	4,730	91%
Other	52,560	12,960	7,200	84%

Source: Statistics Canada, Whole Farm Database

Note: Farms with $10,000 or more in gross revenues
Excludes taxable capital gains

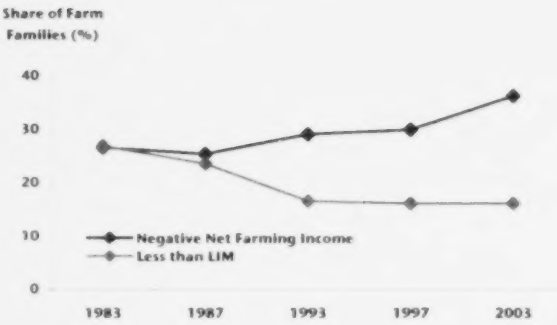
Even with off-farm income, there are families that have low income

- **The share of farm families with negative net farm income has gone up in recent years while the prevalence of low family income has declined.**

The percentage of farm families with negative net farm income increased from 23% in 1983 to 36% in 2003. However, the percentage of farm families with income below the low income measure (LIM) declined from 27% to 16% during the same period.

Chart C4.54

Prevalence of Negative Net Farm Income and Low Family Income, 1983 to 2003



Source: Statistics Canada, Longitudinal Administrative Databank (LAD).
Note: Only includes unincorporated farms.
Includes unattached individuals.
Reports LIM before tax.
Excludes taxable capital gains.

The share of families with negative net farm income but family income above LIM was 35% in 2004.

Chart C4.55

Distribution of Farm Families, 2004

	Net Farm Income (%)		
Total Family Income	Negative	Positive	Total
Below LIM	7.7	8.7	16.4
Above LIM	34.8	48.8	83.6
Total	42.5	57.5	100.0

Source: Statistics Canada, Longitudinal Administrative Databank (LAD).
Note: Reports LIM before tax.
Excludes unattached individuals.
Excludes taxable capital gains.

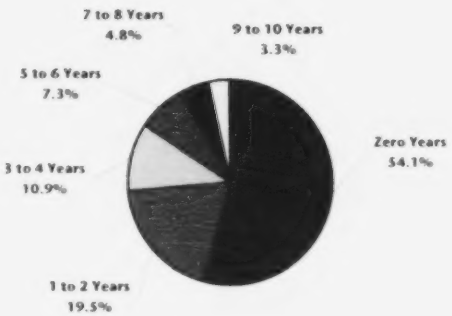
Although some farm families have low farm income, average farm family income is comparable to the average Canadian family

- **Over a 10-year period, 54% of farm families reported family income above LIM for all 10 years.**

  Of the 45% of farm families which reported family income below LIM for one or more years, one-third reported low family income for five or more years.

Chart C4.56

Number of Years Farm Families Reported Low Family Income Between 1994 and 2003



Source: Statistics Canada, Longitudinal Administrative Databank (LAD).
Note: Only includes unincorporated farms.
Includes unattached individuals.
Reports LIM before tax.
Excludes taxable capital gains.

- **The average farm family income for families operating unincorporated farms is slightly lower that the average income received by non-farm families.**

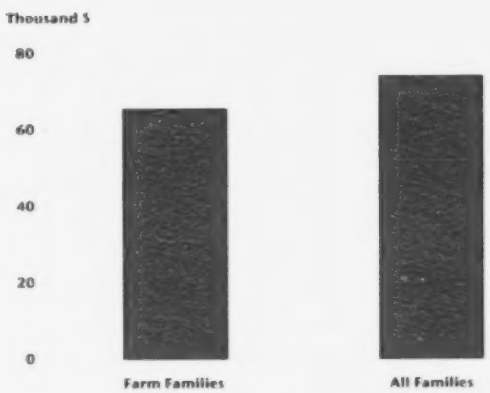
  In 2004, the average total income from all sources for a farm family was $65,364 compared to $73,961 received by the average Canadian family.

  Lifestyle farms, medium and very large business-focussed farms tend to have incomes higher than the average of all farm families, while the other typology groups tend to have income below the average.

  However, average net worth of farm families is higher than non-farm families.

Chart C4.57

Average Family Income, 2004



Source: Statistics Canada, Whole Farm Database and Small Area Administration Data.
Note: Taxable income, does not include capital cost allowance.

SECTION C5

Agricultural Input and Service Suppliers

Input and service suppliers, ranging from multinational firms and commodity brokers to small local businesses, play a major role in the Canadian agriculture and agri-food system. Improvement in inputs and changing production technologies have contributed to rising input prices globally with significant implications for operating expenses. In order to reduce operating expenses many producers are purchasing inputs through co-operatives.

Input suppliers are a whole value chain

- **Agriculture specific input and service suppliers constitute a whole value chain within the agriculture and agri-food system and include input manufacturing, service and retail/ wholesale activities.** They supply and support primary agriculture, and at the same time act as buyers of products from downstream industries (e.g. prepared animal feed from grain and oilseed mills or feeder calves from cow calf operations).

Agriculture specific input and service suppliers are heterogeneous. They range from multinational firms producing agricultural machinery and implements to small local businesses selling feed and pesticides, and from international commodity brokers to the next-door neighbour doing custom work.

Chart C5.1

The Value Chain of Agriculture Specific Input and Service Suppliers

Source: AAFC.

Globally, input prices have steadily increased

- **Since 1981 the increase in farm product prices has not kept pace with the increase in farm input prices.**

  The growth rate for both input and output prices has, however, slowed in recent years.

Chart C5.2

Farm Input Prices and Farm Product Prices, 1971-2005

Source: Statistics Canada

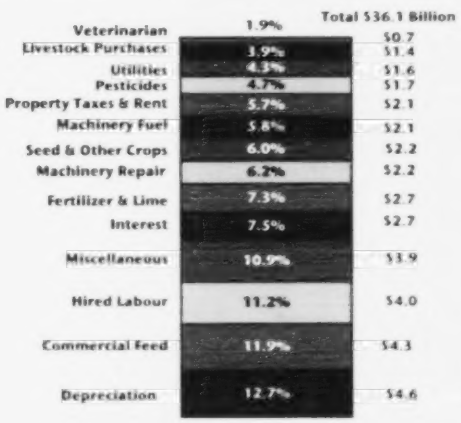
- **In 2006, agriculture producers spent $31.5 billion on operating expenses after rebates.**

  Agriculture producers also incurred another $4.6 billion in depreciation charges.

  Commercial feed is the largest individual expense for agriculture producers at $4.6 billion in 2006 followed by hired labour at $3.9 billion.

Chart C5.3

Farm Net Operating Expenses and Depreciation, 2006



Source: Statistics Canada

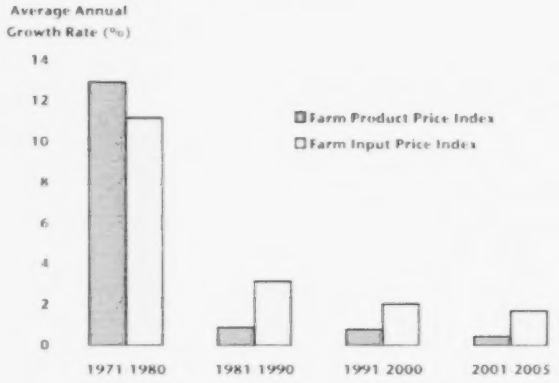
Globally, input prices have steadily increased

- **Since 1981 the increase in farm product prices has not kept pace with the increase in farm input prices.**

  The growth rate for both input and output prices has, however, slowed in recent years.

Chart C5.2

Farm Input Prices and Farm Product Prices, 1971-2005



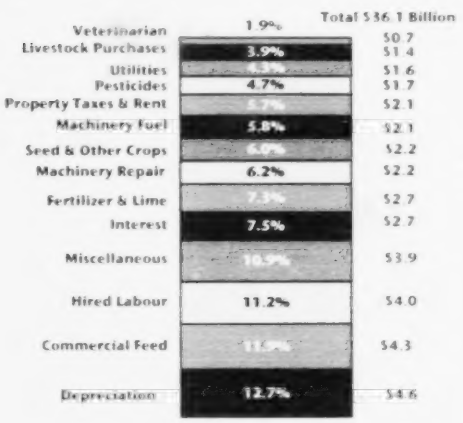
- **In 2006, agriculture producers spent $31.5 billion on operating expenses after rebates.**

  Agriculture producers also incurred another $4.6 billion in depreciation charges.

  Commercial feed is the largest individual expense for agriculture producers at $4.6 billion in 2006 followed by hired labour at $3.9 billion.

Chart C5.3

Farm Net Operating Expenses and Depreciation, 2006



Improvements in inputs and changing agronomic techniques have contributed to rising input costs

- **The cost of production is very much influenced by fuel prices.**

  Farm expenses on machinery fuel have risen significantly since 2004 due to the increases in fuel prices.

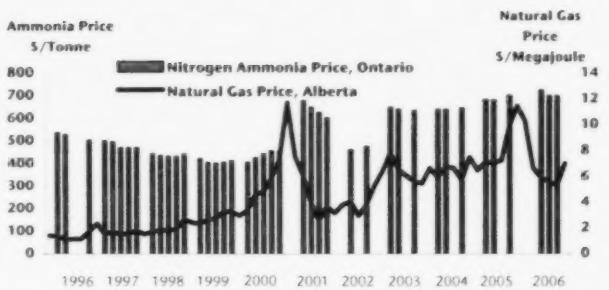
Chart C5.4
Farm Expenses on Machinery Fuel, 1980-2006

Source: Statistics Canada.

- **Natural gas prices have influenced the prices of nitrogen fertilizer.**

  This is because natural gas is the main input into the production of ammonia, and ammonia in turn is the basic component used in nitrogen fertilizer manufacturing.

Chart C5.5
Nitrogen Ammonia & Natural Gas Prices, 1996-2006



Source: Natural Resources Canada and Ridgetown College, University of Guelph.

- **Over time, agricultural producers have adopted different farming practices to either improve yields, reduce costs or differentiate their products, which are creating demand for different kinds of inputs.**

  For example, with a decrease in summerfallow and more intensive farming, chemical usage, such as fertilizer and pesticides, has been steadily growing over time.

Chart C5.6
Chemical Input Usage in Farming, 1971-2005

Source: Statistics Canada and AAFC calculations.

Producers purchase a signficant proportion of their inputs through co-operatives

- **Co-operatives of farm supplies are businesses owned by farmers which strive to provide high quality and affordable farm supplies for farmers.**

  The surplus generated by these co-operatives is returned to farmer members, thereby contributing to farm incomes.

- **Market share for co-operative sales of farm petroleum rose between 1986 and 2004,** primarily due to expanded operations in western Canada.

  However, there was a significant decline in co-operative market share in fertilizer and chemical sales between 2001 and 2004. The main contributing factor was the demutualization of Agricore Co-operative in 2001, which previously had sold a significant quantity of fertilizer and chemicals.

Chart C5.7

Market Shares of Co-operatives in Farm Supplies, 1986-2004

	1986	1991	1996	2001	2004
	% of Total Farm Expenditures				
Fertilizer & Chemicals	31	36	35	41	23
Farm Petroleum	22	29	27	32	45
Seed	23	17	17	6	6
Feed	26	25	17	15	14

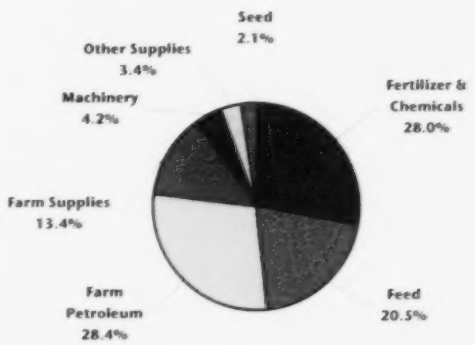
Source: Co-operatives Secretariat, AAFC and Statistics Canada

- **Total co-operative supply sales in 2004 were $3.4 billion, a decline from $5.2 billion in 2003.**

  Co-operatives sell a wide range of supplies from fertilizer and chemicals to feed, farm machinery, farm supplies (such as water bowls and wheelbarrows) and non-farm supplies (such as home garden seeds and clothing).

Chart C5.8

Co-operative Supply Sales, 2004



Source: Co-operatives Secretariat, AAFC

Note: Sales excluding wholesalers sales.

SECTION D

Government and the Agriculture and Agri-Food Sector

SECTION D1

Government Expenditures in Canada

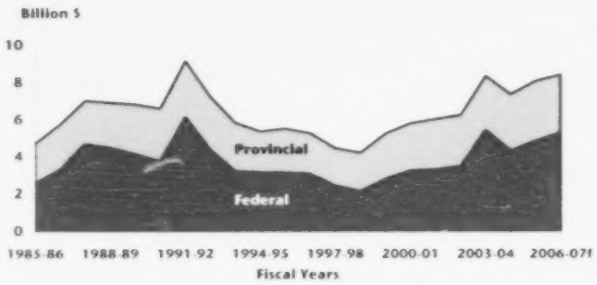
Government expenditures in support of the agriculture and agri-food sector rose to record high levels in 2006-07. As a share of sector GDP, government expenditures rose slightly to 40%. Program payments made up the largest portion of government expenditures to the sector, followed by research and inspection spending by the federal government. Public sector R&D spending on agriculture has increased over the past few years.

Government expenditures in support of the agriculture and agri-food sector have grown over time but have declined as a share of GDP

- **Federal and provincial governments provide a significant level of support to the agriculture and agri-food sector in Canada, but with variations across provinces**

  Total government expenditures in support of the agriculture and agri-food sector were estimated to be $8.4 billion for the 2006-07 fiscal year. This is the second largest level of government support ever recorded for the sector in Canada.

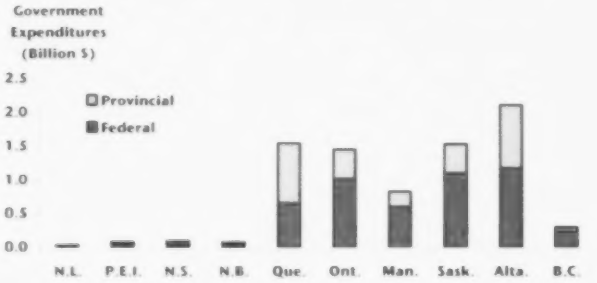
Chart D1.1
Government Expenditures in Support of the Agriculture and Agri-Food Sector, 1985-86 to 2006-07 Fiscal Years



Source: AAFC
Note: 2006-07 figures are forecasts.

- **Although the federal government contributes a larger share of total support in most provinces, provincial governments in Quebec, and Newfoundland and Labrador provided a larger share of total support in the 2006-07 fiscal year.**

Chart D1.2
Government Expenditures in Support of the Agriculture and Agri-Food Sector by Province, 2006-07 Fiscal Year

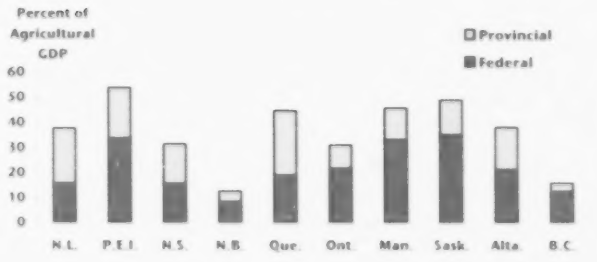


Source: AAFC
Note: 2006-07 figures are forecasts.

- **In the 2006-07 fiscal year, total government expenditures in support of the agriculture and agri-food sector were estimated at 40% of total sector GDP, which is slightly lower than in 2003-2004 due in most part to the BSE incidence.**

  The agricultural sector in Prince Edward Island, Saskatchewan, Manitoba and Quebec received the most government support, while British Columbia and New Brunswick received the lowest sector support in relation to sector GDP.

Chart D1.3
Government Expenditures in the Agriculture and Agri-Food Sector as a Share of Sector GDP by Province, 2006-07 Fiscal Year



Source: AAFC
Note: 2006-07 figures are forecasts.

Program payments make up the largest portion of government support

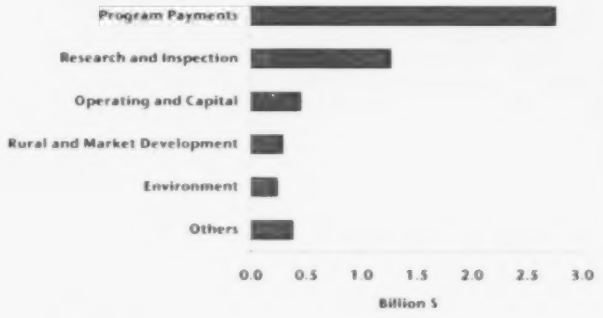
- **In the 2006-07 fiscal year, program payments were estimated to account for the largest share of federal government expenditures in support of the agriculture and agri-food sector in Canada.**

  Program payments accounted for 51% of total federal government expenditures to the sector in the 2006-2007 fiscal year.

  Research and inspection expenditures are the second most important government expenditure, accounting for 24% of the total, followed by operating and capital expenditures, at 8%.

Chart D1.4

Federal Government Expenditures in Support of the Agriculture and Agri-Food Sector by Major Category, 2006-07 Fiscal Year



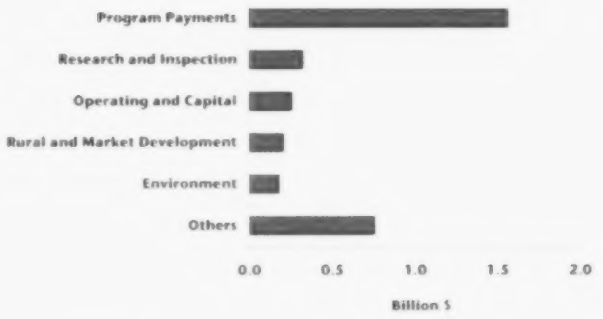
Source: AAFC
Note: 2006-07 figures are forecasts

- **At the provincial level, program payments are also the most important government expenditure in support of the agriculture and agri-food sector.**

  Program payments accounted for 48% of total provincial expenditures in the sector in the 2006-2007 fiscal year. However, only 10% of total provincial expenditures were spent on research and inspection compared to 24% at the federal level.

Chart D1.5

Provincial Government Expenditures in Support of the Agriculture and Agri-Food Sector by Major Category, 2006-07 Fiscal Year



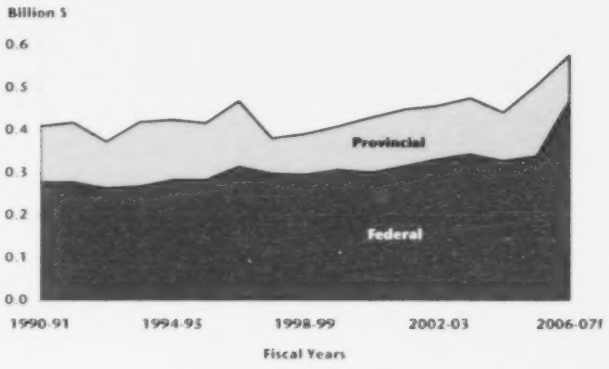
Source: AAFC
Note: 2006-07 figures are forecasts

Public research expenditures on agriculture and agri-food are important investments for the future growth of the sector

- **Total public research expenditures for the agriculture sector have increased steadily over the last decade. The amount of $505 million for the 2005-06 fiscal year, and the estimated amount of $576 million for the 2006-07 fiscal year indicate an increase in this type of expenditure over the past two fisal years.**

In Canada, public research expenditures in agriculture are funded predominantly by the federal government. On average, federal expenditures have accounted for 74% of total public research expenditures over the past ten years (1997-98 to 2006-07).

Chart D1.6
Government Research Expenditures on Agriculture, 1990-91 to 2006-07 Fiscal Years



Source: AAFC

Note: 2006-07 figures are forecasts

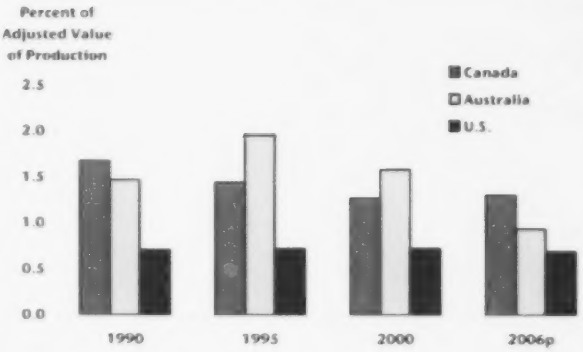
- **Public sector investment in agri-food R&D in Canada has fallen over time when measured as a share of value of agricultural production.**

Meanwhile, public R&D support to the agri-food sector in the U.S. remained relatively stable over the 1990-2006 period.

In 2006, public R&D investment - expressed as a share of value of production - is higher in Canada (1.3%) than in the U.S. (0.7%) and Australia (0.9%).

In Canada, a large part of publicly-funded research is carried out by the federal government, although the government gives grants and contributions to private industry to do research. In the U.S., the majority of publicly-funded research is carried out by private firms and land grant universities.

Chart D1.7
Public R&D Support to Agri-Food Sector as a Share of Adjusted Value of Production, 1990-2006



Source: Agricultural Policies in OECD Countries: Monitoring and Evaluation 2007

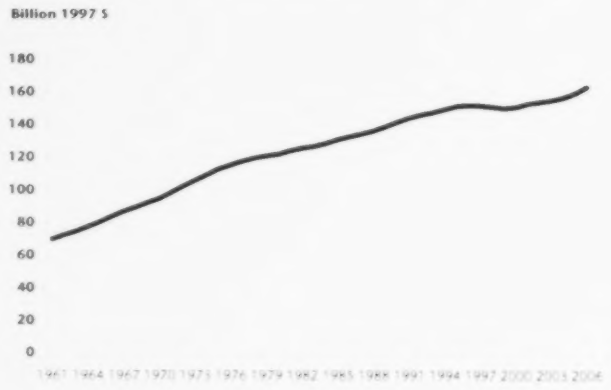
Note: 2006 figures are preliminary

Public Infrastructure investment has contributed positively to productivity growth in food processing

- **The total stock of public infrastructure has increased every year since 1961, but this growth has slowed over time.** The annual growth rate was around 4.6% in the 1960s but only about 2% per year since the 1980s. Growth in the stock of transportation infrastructure has similarly declined, reflecting a slowdown in the expansion of road and highway systems.

Chart D1.8

Total Stock of Public Infrastructure in Canada, 1961-2006



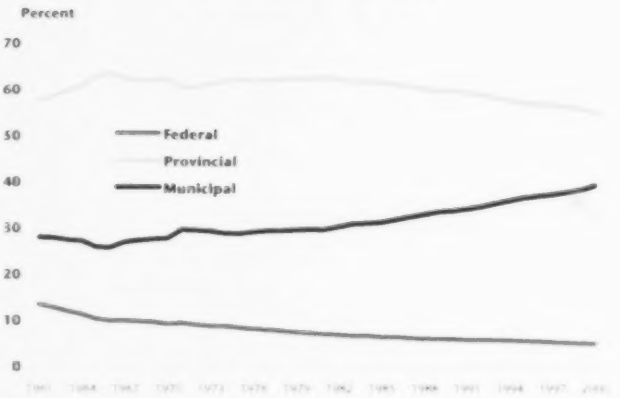
Source: Statistics Canada

- **Research shows that public infrastructure investment has had a significantly positive influence on productivity growth in food processing**, reducing the cost of production and output. Research shows that for every $1 spent on public infrastructure, food processing productivity increases by 0.8%.

  While most transportation infrastructure is owned by provincial governments, municipal governments have been assuming an increasingly important role in the provision and improvement of local roads and highways. The federal government's share of the national stock of transportation infrastructure was 12% in the 1960s and fell to only 6% in the 1990s.

Chart D1.9

Transportation Infrastructure Share of each Level of Government, 1961-2000



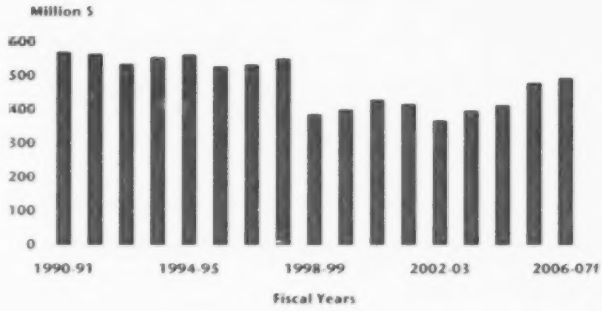
Source: AAFC Calculations

The government also uses favourable tax measures to support the agriculture and agri-food sector

- **Foregone tax revenue (tax expenditures) is an important source of government support to the agriculture and agri-food sector.**

  In fiscal year 2006-07, provincial tax exemptions and rebates associated with primary agriculture were estimated at $490 million. Tax expenditures have been increasing since 2002-03.

Chart D1.10
Support to Farm Producers through Tax Rebates and Exemptions, 1990-91 to 2006-07 Fiscal Years



Source: AAFC

Note: Includes fuel tax rebates, fuel tax exemptions and property tax rebates; excludes sales and income tax rebates.
2006-07 figures are forecasts.

- **Corporate income tax rates for manufacturing and processing have fallen significantly in all provinces since 1960.**

  In Ontario and Quebec, the combined federal and provincial corporate tax rates were around 52% in the 1960s, but have declined since then. The rates declined in Ontario and Quebec to 34% and 31% respectively in 2005.

  These corporate income tax rates apply to corporations primarily involved in food and beverage processing and do not apply to incorporated farms.

Chart D1.11
Combined Federal/Provincial Corporate Income Tax Rates for Manufacturers and Processors, Ontario and Quebec: 1960-2005

Source: AAFC, "Corporate Income Tax Rate Database: Canada and the Provinces, 1960-2005"

SECTION D2

Producer Support Estimates (PSE) and Agricultural Policies in Canada and Other Countries

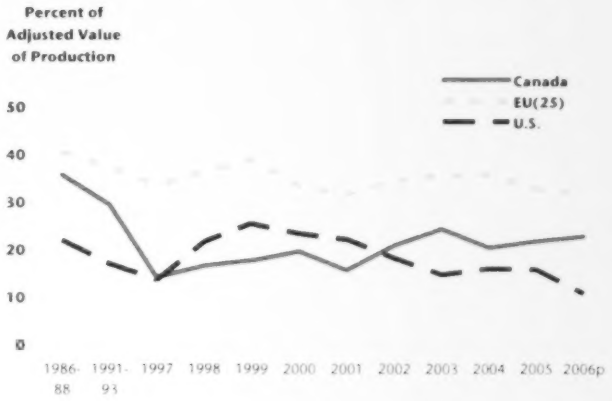
Agricultural policies in Canada and other countries have evolved over time. Changes have been made not only by decreasing the level of support but also by modifying the type of support. Some countries have made significant reforms to their agricultural policies. The Organisation for Economic Co-operation and Development (OECD) indicators and the World Trade Organization (WTO) classification for domestic support are used to present these policy changes.

In recent years, support to Canadian producers in percentage PSE has risen above that of the U.S.

- **In 2006, the PSE for Canada was 23% of adjusted value of production compared to 32% for the EU (25) and 11% for the U.S.**

  In recent years, Canadian support to producers (in percentage PSE) has been higher than the U.S. mainly because of the federal and provincial governments' responses to exceptional circumstances, which resulted in persistent low farm income.

Chart D2.1
Producer Support Estimate, 1986-2006



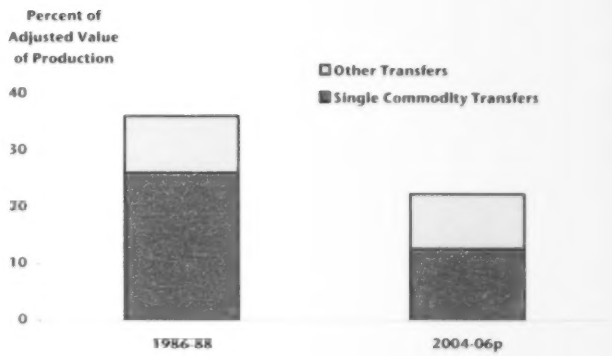
Source: Agricultural Policies in OECD Countries: Monitoring and Evaluation 2007.
Note: 2006 figures are preliminary.

- **Over time, Canada has moved towards more decoupled and less distorting forms of support.**

  Support to Canadian agricultural producers fell from 36% of adjusted value of production in 1986-88 to 22% in 2004-06. Thus, producers have become less reliant on government support.

  In addition, commodity-specific support has decreased substantially in favour of more decoupled and less distorting forms of support and represents 57% of the total PSE in 2004-06 compared to 72% in 1986-88. Nevertheless, commodity-specific support continues to account for a more than half of producers' support in Canada.

Chart D2.2
Composition of the PSE by Commodity Specificity, Canada



Source: Agricultural Policies in OECD Countries: Monitoring and Evaluation 2007.
Note: 2006 figures are preliminary.

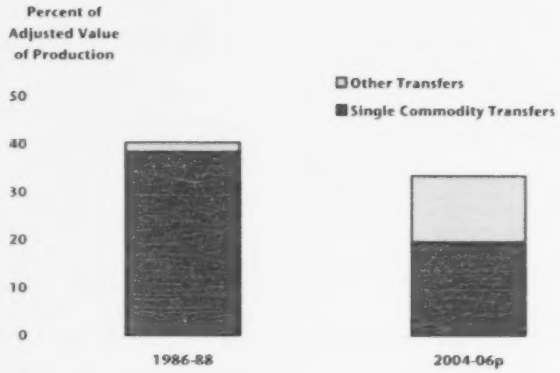
Developments in policy directions in other countries point to reduced direct support

- **Between 1986-88 and 2004-06, the EU reduced its support to agricultural producers from 41% to 34% of the adjusted value of production.**

  In addition, commodity-specific support in the EU has decreased substantially in favour of more decoupled and less distorting forms of support and represents 58% of the total PSE in 2004-06 compared to 94% in 1986-88. Nevertheless, commodity-specific support continues to account for more than half of producers' support in the EU.

Chart D2.3

Composition of the PSE by Commodity Specificity, EU(25)



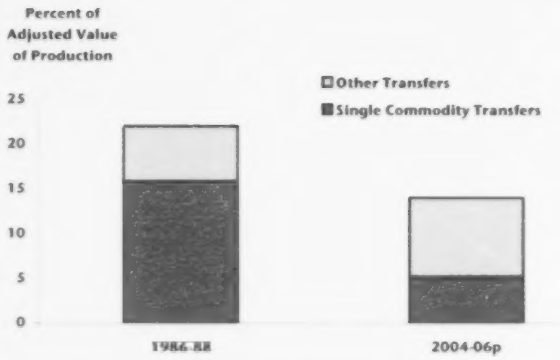
Source: Agricultural Policies in OECD Countries: Monitoring and Evaluation 2007
Note: 2006 figures are preliminary.

- **Between 1986-88 and 2004-06, the U.S. support to agricultural producers decreased from 22% to 14% of the adjusted value of production.**

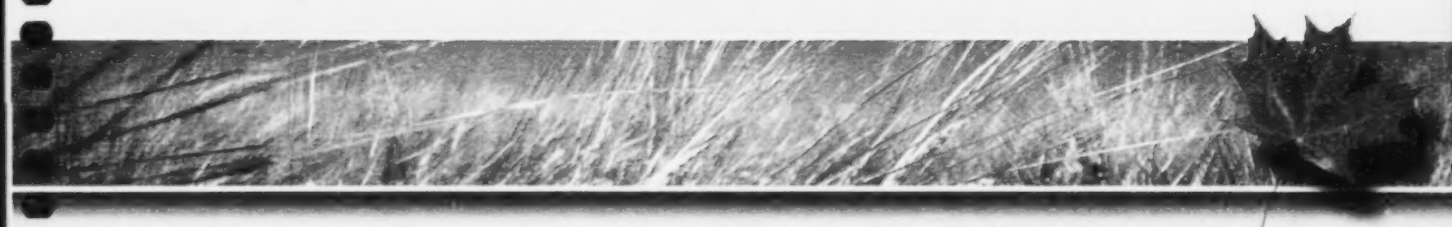
  In addition, commodity-specific support has decreased substantially in favour of more decoupled and less distorting forms of support and represents 37% of the total PSE in 2004-06 compared to 72% in 1986-88.

Chart D2.4

Composition of the PSE by Commodity Specificity, U.S.



Source: Agricultural Policies in OECD Countries: Monitoring and Evaluation 2007
Note: 2006 figures are preliminary.



Glossary

Acronyms

AAFC	Agriculture and Agri-Food Canada
AMS	Aggregate Measure of Support
ASM	Annual Survey of Manufactures
ASML	Annual Survey of Manufactures and Logging
AVOP	Adjusted Value of Production
BICO	Bulk, Intermediate, and Consumer-Oriented
BSE	Bovine Spongiform Encephalopathy
CADMS	Canadian Agriculture Dynamic Micro Simulation
CAIS	Canadian Agricultural Income Stabilization Program
CANSIM	Canadian Socio-economic Information Management System
CCA	Capital Cost Allowance
CPI	Consumer Price Index
CR	Concentration Ratio
ERS	Economic Research Service
EU	European Union
FAO	Food and Agriculture Organization
FBT	Food, Beverage and Tobacco
FDI	Foreign Direct Investment
FFN	Functional Foods and Nutraceuticals
FPPI	Farm Product Price Index
GDP	Gross Domestic Product
GSSE	General Services Support Estimate
IFCN	International Farm Comparison Network
IO	Input/Output
IP	Intellectual Property
LAD	Longitudinal Administrative Databank
LIM	Low Income Measure
NAFTA	North American Free Trade Agreement
NAICS	North American Industrial Classification System
NFI	Net Farm Income
NISA	Net Income Stabilization Account
NOC	National Occupation Classification
NPD Group	A global market research company
OACC	Organic Agricultural Centre of Canada
OECD	Organisation for Economic Co-operation and Development
PDI	Personal Disposable Income
PMWS	Post-weaning Multi-systemic Wasting Syndrome
PSE	Producer Support Estimate
PST	Provincial Sales Tax
RTA	Relative Trade Advantage
R&D	Research and Development
SNA	System of National Accounts
TFP	Total Factor Productivity
TDP	Taxation Data Program
USDA	United States Department of Agriculture
USDOE	United States Department of Energy
WTO	World Trade Organization

Agriculture and Agri-Food Sector
The agriculture and agri-food sector is composed of all industries whose primary role is to produce food and agricultural products. It encompasses both primary agriculture and Food, Beverage and Tobacco (FBT) processors.

Canadian Agriculture and Agri-Food System
The Canadian agriculture and agri-food system is a value chain of industries focussed on producing agricultural and food products. It includes agricultural input and service suppliers, primary agriculture, food, beverage and tobacco processors, food retailers/wholesalers, and foodservice establishments.

Unless otherwise noted, component stages of the agriculture and agri-food system are defined according to the North American Industrial Classification System (NAICS). The glossary contains a detailed listing of included industries for each component stage of the system.

Agricultural Input & Service Suppliers
Agricultural input and service suppliers are composed of the following industries as defined by the NAICS:

at the 4 digit level
- 1151 Support Activities for Crop Production
- 1152 Support Activities for Animal Production
- 3253 Pesticide, Fertilizer and Other Agricultural Chemical Manufacturing
- 4171 Farm, Lawn and Garden Machinery and Equipment Wholesaler-Distributors
- 4183 Agricultural Supplies Wholesaler-Distributors

at the 5 digit level
- 33311 Agricultural Implement Manufacturing

Primary Agriculture
Primary agriculture is composed of the following industries as defined by NAICS:

at the 4 digit level
- 1111 Grain and Oilseed Farming
- 1112 Vegetable and Melon Farming
- 1113 Fruit and Tree Nut Farming
- 1114 Greenhouse, Nursery and Floriculture Production
- 1119 Other Crop Farming
- 1121 Cattle Ranching and Farming
- 1122 Hog and Pig Farming
- 1123 Poultry and Egg Production
- 1124 Sheep and Goat Farming
- 1125 Animal Aquaculture
- 1129 Other Animal Production

Food, Beverage and Tobacco Processors
FBT processors are composed of the following industries as defined by NAICS:

at the 3 digit level
- 311 Food Manufacturing
- 312 Beverage and Tobacco Product Manufacturing

The System's Components (cont'd)

Food Retailers/Wholesalers
Food retailers/wholesalers are composed of the following industries as defined by NAICS:

at the 3 digit level
- 411 Farm Product Wholesaler-Distributors
- 413 Food, Beverage and Tobacco Wholesaler-Distributors
- 445 Food and Beverage Stores

at the 5 digit level
- 41911 Farm Product Agents and Brokers
- 41913 Food, Beverage and Tobacco Agents and Brokers
- 44422 Nursery Stores and Garden Centres
- 49312 Refrigerated Warehousing and Storage
- 49313 Farm Product Warehousing and Storage

Foodservice
Foodservice is composed of the following industries as defined by NAICS:

at the 3 digit level
- 722 Food Services and Drinking Places

at the 4 digit level
- 4542 Vending Machine Operators

Food Distribution Sector
The food distribution sector is composed of all industries whose primary role is to directly provide and service the final consumer with food and agricultural products. It encompasses food retailers/wholesalers and foodservice establishments.

Commercial Foodservice
Commercial foodservice includes full-service restaurants, limited-service restaurants, social and contract caterers and taverns.

Full-Service Restaurants include licensed and unlicensed fine dining restaurants, family restaurants and restaurant bars.

Limited-Service Restaurants include cafeterias, fast-food restaurants, food courts, and take-out and delivery establishments.

Social Caterers provide foodservice for special events.

Contract Caterers supply foodservice to airlines, railways, institutions and at recreational facilities.

Taverns are establishments primarily engaged in serving alcoholic beverages for immediate consumption, such as pubs, cocktail lounges and nightclubs.

The System's Components (cont'd)

Food-Only Processors
Food-only processors refer to manufacturers of food where food is defined in the narrowest sense (i.e. excludes beverage and tobacco products).

Non-Food Processors
Non-food processors encompass all industrial uses of farm products other than food or animal feed consumption. It includes bio-products manufacturers as well as the more traditional non-food industries such as leather tanneries and textile mills.

Other and Non-Commercial Foodservice
Other foodservice includes accommodation, institutional, retail and other foodservice.

Accommodation foodservice is foodservice offered by hotels, motels and resorts.

Institutional foodservice is foodservice in hospitals, residential care facilities, schools, prisons, **factories and offices.**

Retail foodservice is foodservice operated by department stores and convenience stores.

Other foodservice includes vending machines, movie theatres, stadiums and other seasonal or entertainment operations.

Non-Financial Industries

Non-financial industries are composed of the following industries, as defined by the North American Industry Classification System (NAICS).

11	Agriculture, Forestry, Fishing and Hunting
211	Oil and Gas Extraction
213	Support Activities for Mining
22	Utilities
23	Construction
31-33	Manufacturing
41	Wholesale Trade
44-45	Retail Trade
48-49	Transportation and Warehousing
51	Information and Cultural Industries
53	Real Estate and Rental and Leasing
54	Professional, Scientific, and Technical Services
56	Administrative and Support and Waste Management and Remediation Services
61	Educational Services
62	Healthcare and Social Assistance
71	Arts, Entertainment, and Recreation
72	Accommodation and Food Services
811	Repair and Maintenance
812	Personal and Laundry Service

Farm Types

Census Farm
An agricultural operation with gross farm receipts > $2,499 that produces at least one of the following products intended for sale: crops (field crops, tree fruits or nuts, berries or grapes, vegetables, seed); livestock (cattle, pigs, sheep, horses, exotic birds, etc.), animal products (milk or cream, eggs, wool, fur, meat), or other agricultural products (greenhouse or nursery products, Christmas trees, mushrooms, sod, honey, maple syrup products).

Organic Farms
These are farms that produce food through a process characterized by mandatory soil building crop rotations and absence of chemicals or synthetic inputs.

Certified Organic Farms
These are organic farms with third-party accreditation.

Non-Certified Organic farms
These are organic farms not accredited by a third-party.

Hutterite Farms
This is a form of communal farms involving the Hutterites, where provision for individual members and their families come from the common resources.

Commercial Farms
These are business-focused farms with most of their income derived from farming.

Non-Commercial Farms
These are non-business-focussed farms.

Communal Farms/Operators
This is a system of farms where operators pull production resources together.

Transitional Organic Production
This is a process of converting from a conventional to an organic farm.

Trade Categories

Agriculture and Agri-Food Exports
Agriculture and agri-food exports include the export of agriculture commodities, food (excluding fish and fish products), non-alcoholic beverages (including bottled water), alcoholic beverages, tobacco products, and floriculture and nursery.

Agriculture and Agri-Food Imports
Agriculture and agri-food imports include the import of agriculture commodities, food (excluding fish and fish products), non-alcoholic beverages (including bottled water), alcoholic beverages, tobacco products and floriculture and nursery.

Intra-Firm Trade
Intra-firm trade is a transaction between different parts of multinational firms located in different countries. It also encompasses the assigning of different product mandates to different production facilities by headquarters.

Intra-Industry Trade
Intra-industry trade is trade between two countries of the same commodity/product.

Intra-Regional Trade
Intra-regional trade is trade between regions in a given country or geographic area.

Trade Classification
Trade statistics for the agriculture and agri-food system are categorized according to the BICO classification system which separates products into three different groupings: bulk, intermediate, and consumer oriented.

- **Bulk (B)**
  Products that have received little or no processing, such as, wheat, feedgrains and oilseeds.
- **Intermediate (I)**
  Products that have received some processing, but generally are not yet ready for final consumption. Examples include wheat flour, vegetable oils and slaughter animals.
- **Consumer Oriented (CO)**
  Products that require little or no additional processing and are basically ready for human consumption. Examples include dairy products, eggs, beef, fresh fruits, and floriculture, as well as canned soups, frozen meals, baby foods, etc.

Value-Added Trade
Value-added exports/imports include exports/imports of all intermediate and consumer-oriented goods.

Government Support Categories

Government Expenditures
Government spending (at all levels) on agriculture and food processing in a year, both direct and indirect, to individuals, agencies or associations.

Major Categories of Expenditures

Development, Trade and Environment-Related Program Expenditures
Include administration and capital expenditures incurred by the government to work on regional development, marketing and trade, and environmental activities as well as grants and contributions issued by the government for work on these activities.

Operating and Capital Expenditures
Include government expenditures on general administration and management, and on policy, information and statistical services.

Other Expenditures
Include government expenditures on food aid and international assistance, extension, and education as well as social program payments.

Program Payment Expenditures
Include payments for income support and stabilization programs, ad hoc and cost reduction programs, crop insurance programs and financing assistance programs.

Research and Inspection Expenditures
Include administration and capital expenditures incurred by the government to perform research and inspection activities, as well as grants and contributions issued by the government for work on these activities.

Storage and Freight Assistance Expenditures
Program payments for storage and freight.

Public Infrastructure
The quantity of physical capital owned by the municipal, provincial and federal governments of Canada. This includes buildings such as schools, libraries and post offices, engineering structures, and machinery such as snow removal vehicles and ambulances.

Transportation Infrastructure
This is a subset of engineering structures, and includes highways, roads, streets, runways, rail track, bridges, and tunnels.

Government Support Measures

Aggregate Measurement of Support (AMS)
AMS is the indicator on which the domestic support discipline for the Uruguay Round Agreement on Agriculture is based. It is determined by calculating a market price support estimate for each commodity receiving such support, plus non-exempt direct payments or any other subsidy not exempted from reduction commitments, less specific agricultural levies or fees paid by producers.

Amber Box
A World Trade Organization (WTO) term which refers to any government support to agriculture considered to distort production and trade. These include price support, and subsidies directly related to production quantities.

Blue Box
A WTO term which refers to government support measures to agriculture considered to distort production and trade, but with conditions. These conditions limit production, and therefore reduce distortion.

De minimis
Currently developed countries are allowed a minimal amount of Amber Box support ("de minimis"). For support that is not given to specific products, this is defined as 5% of the value of total agricultural production. For product-specific support, the limit is 5% of production of that product. WTO rules permit developing countries to have up to 10% de minimis.

Green Box
A WTO term which refers to government support measures to agriculture considered not to distort trade or at most cause minimal distortion, and therefore permitted with no limits.

Producer Support Estimate (PSE)
A yearly measure of policy support to farm producers. It is the sum of market price support and budgetary payments to producers, expressed as a percentage of the Adjusted Value of Production.

Adjusted Value of Production (AVOP)
The value of production plus the direct transfers received by producers in the current year.

Economic and Statistical Terminology

Biomass
Biomass is living and recently dead biological material which can be used as fuel or for industrial production. Most commonly, it is plant matter used for biofuel production, but also includes plant or animal matter used for the production of fibres, chemicals or heat.

Concentration Ratio (CR4)
Concentration ratio is a measure of an industry's concentration level and expresses sales of a set number of the top firms in the industry as a percentage of total industry sales. CR4 is the acronym for the concentration ratio of the top four firms in the industry.

Constant Prices
Constant prices refers to a value from which the overall effect of a general price inflation has been removed.

Debt to Asset Ratio
Debt to asset ratio is borrowings plus loans and accounts with affiliates all divided by total assets. Total assets is the sum total of economic resources over which the enterprise exercises a certain control, and includes cash and deposits; accounts receivable and accrued revenue; inventories; investments and accounts with parent companies, subsidiaries and affiliates; portfolio investments; loans given to other enterprises; and capital assets.

Debt to Equity Ratio
Debt to equity ratio is the ratio of debt to equity which is the difference between total assets and total liabilities.

Farm Family Income
Farm family income is the sum of the total income of the operator and his/her family members. It includes income from both farm and off-farm sources.

Farm Market Receipts
Farm market receipts refers to cash income from the sale of agricultural commodities, but excludes direct program payments to producers.

Farm Net Worth
Farm net worth is measured as the total assets of the farm evaluated at current market value less total liabilities.

Foreign Direct Investment (FDI)
FDI refers to investment by non-residents in an enterprise where the non-residents own 10 percent or more of the ordinary shares or voting power in incorporated enterprises or the equivalent in unincorporated enterprises.

Geometric (infinite)
End-year net stock.

General Services Support Estimate (GSSE)
GSSE is an indicator of the value of gross transfers to general services provided to agriculture. These payments are intended for the agriculture sector generally, and not for individual farmers. The payments include research and development, agricultural schools, inspection services, infrastructure, marketing and promotion, public stockholding, and miscellaneous payments.

Gross Domestic Product (GDP)
The GDP for a country is the total unduplicated value of the goods and services produced in that country during a given period.

Economic and Statistical Terminology (cont'd)

Gross Farm Receipts
Gross farm receipts include cash income from the sale of agricultural commodities and direct program payments. They are compiled from census forms sent to all farms every five years.

Gross Margin Ratios
Gross margin ratios are calculated as the ratio of gross margin earned by a farm relative to its market revenue.

Intramural R&D Expenditures
Intramural R&D expenditures are all expenditures on research and development that are made by a particular organization in a given time frame and includes work financed by others.

Intra-Regional Trade
Trade between two regions in a given location. For example trade between Canadian provinces.

Labour Productivity
Labour productivity is a measure of an industry's output per hour of labour worked.

Low Income Measure (LIM)
LIM is defined as half (50%) of median family income in Canada, adjusted for family size and composition.

Multifactor Productivity
Multifactor productivity measures the efficiency in use of all inputs. Its growth is calculated as the rate of growth of output less the rate of growth of all inputs.

Net Operating Income
Net operating income is a term used at the farm level, and it is the difference between gross farm revenues and total farm cash expenses.

Off-Farm Income
The term off-farm income is a bit misleading in that it includes wages and salaries paid to family members for work done on the farm. On average, for Canada, wages and salaries earned on the farm account for 22% of total wages and salaries earned for a farm family operating an unincorporated farm. The percentage varies by farm type and province.

Operating Margin
This is operating revenue minus operating expenses.

Profit Margin Ratio
The profit margin ratio is calculated as operating profits divided by operating revenues, multiplied by 100.

Rate of Return on Long-term Capital
The rate of return on long-term capital is calculated as operating income (without deducting either taxes or interest paid) divided by long-term capital where long-term capital is taken to be the sum of shareholders' equity and long-term debt.

Realized Net Farm Income
Realized net farm income is calculated as realized net market Income plus government program payments.

Realized Net Market Income
Realized net market income is calculated as farm market receipts plus income-in-kind less operating expenses and depreciation.

Economic and Statistical Terminology (cont'd)

Relative Trade Advantage (RTA)
RTA is measured by a country's net share of world trade in a given product relative to the net trade of all traded goods.

Return on Equity Ratio
The return on equity ratio is calculated as after-tax profit multiplied by 4, divided by total equity, multiplied by 100.

Total Factor Productivity (TFP)
TFP is measured by output divided by all inputs (i.e. capital, labour etc.).

Value-Added Production
Value-added production refers to products that have undergone some processing.

Data Sources and References

Data Sources and References

Chart	Source
Section A Special Features	
Section A1: Census of Agriculture Summary	
A1.1-A1.27	Statistics Canada, Census of Agriculture. Statistics Canada, 2006 Census of Agriculture. (http://www.statcan.ca/english/agcensus2006/index.htm) Statistics Canada, 2001 Census of Agriculture. (http://www.statcan.ca/english/agcensus2001/index.htm) Statistics Canada, 1996 Census of Agriculture. (http://www.statcan.ca/english/census96/agri.htm)
Section A2: New Industrial Uses of Agricultural Products	
A2.1	Various sources.
A2.2	The Bioeconomy: Positioning the Agriculture and Agri-Food Sector to Seize the Opportunities, 2007, AAFC.
A2.3	Statistics Canada, Bioproduct Development Survey, 2003.
A2.4	Riese, J. Beyond the Hype – Growth in the Biofuels Industry, March 22, 2007.
A2.5	Energy Information Administration, International Energy Annual Report 2004.
A2.6	United States Department of Energy (USDOE), www.economagic.com and www.imperialoil.com
A2.7 & A2.9	www.earthtrends.com
A2.8	"Global Fuel Trends: Monthly Update, March 2006". (www.earthtrends.com)
A2.10	United States Department of Agriculture (USDA), ERS AutoFAX 12005 - AMS Grain and Feed Market News. Prepared by AAFC.
A2.11-A2.14 & A2.16-A2.19	Statistics Canada, Bioproduct Development Survey, 2003.
A2.15 & A2.20	Statistics Canada, 2004 FFN Survey.
Section B The Agriculture and Agri-Food System and the Canadian Economy	
Section B1: GDP and Employment	
B1.1 & B1.2	Statistics Canada. - CANSIM Table 379-0017 - Gross Domestic Product (GDP) at basic price by North American Industry Classification System (NAICS), annual. -CANSIM Table 301-0003 - Annual Survey of Manufactures (ASM)*T*. -CANSIM Table 301-0006 - Annual Survey of Manufactures and Logging (ASML). -Labour Force Survey, special tabulation for AAFC.

Data Sources and References (cont'd)

Chart	Source
B1.3 & B1.4	Statistics Canada. -CANSIM Table 379-0025 Gross Domestic Product (GDP) at basic price by North American Industry Classification System (NAICS) and province, annual; -Special tabulation for AAFC.
B1.5 & B1.6	Statistics Canada, Labour Force Survey special tabulation for AAFC.
B1.7	Statistics Canada Input/Output Model, 2003.
Section B2: International Trade and Global Developments	
B2.1 & B2.2	Global Trade Atlas and AAFC calculations.
B2.3-B2.10, B2.12-B2.17, & B2.20-B2.21	Statistics Canada, special tabulation for AAFC (Canadian International Merchandise Trade Database).
B2.11	Statistics Canada, special tabulation for AAFC (Canadian International Merchandise Trade Database). Industry Canada, Strategis Trade Data Online. (http://strategis.ic.gc.ca/sc_mrkti/tdst/engdoc/tr_homep.html) Global Trade Atlas.
B2.18	American Farm Bureau.
B2.19	World Bank, World Development Indicators Database.
Section B3: Competitiveness, Productivity Growth and Innovation	
B3.1	Food and Agriculture Organization of the United Nations (FAO), FAOSTAT. (http://faostat.fao.org/default.aspx?lang=en) Statistics Canada, special tabulation for AAFC (Canadian International Merchandise Trade Database).
B3.2-B3.6	AAFC calculations based on Global Trade Atlas.
B3.7	Statistics Canada, Annual Survey of Manufactures.
B3.8	U.S. Bureau of Labor Statistics.
B3.9 & B3.10	Centre for the Study of Living Standards.
B3.11 & B3.12	Groningen Growth and Development Centre, Industry Growth Accounting Database, 2006.
B3.13	Statistics Canada, Crop Statistics, USDA, National Agricultural Statistics.
B3.14	USDA and AAFC.
B3.15 & B3.16	AAFC, The Nature and Extent of Innovation in the Canadian Food Processing Industry.

Data Sources and References (cont'd)

Chart	Source
B3.17	Statistics Canada, Service Bulletin, Science Statistics, "Industrial Research and Development, 2002 to 2006", August 2006. Catalogue 88-001-XIE. (http://www.statcan.ca/english/freepub/88-001-XIE/88-001-XIE2006004.pdf)
	Statistics Canada, Service Bulletin, Science Statistics, "Industrial Research and Development, 2001 to 2005", June 2005. Catalogue 88-001-XIE. (http://www.statcan.ca/english/freepub/88-001-XIE/88-001-XIE2005004.pdf)
	Statistics Canada, special tabulation for AAFC.
B3.18	Statistics Canada, CAMSIM Table 379-00231 Gross Domestic Product (GDP) at basic price in current dollars, System of National Accounts (SNA) benchmark values, by North American Industry Classification System (NAICS), annual.
	Statistics Canada, Service Bulletin, Science Statistics, "Industrial Research and Development, 2002 to 2006", August 2006. Catalogue 88-001-XIE. (http://www.statcan.ca/english/freepub/88-001-XIE/88-001-XIE2006004.pdf)
	Statistics Canada, Service Bulletin, Science Statistics, "Industrial Research and Development, 2001 to 2005", June 2005. Catalogue 88-001-XIE. (http://www.statcan.ca/english/freepub/88-001-XIE/88-001-XIE2005004.pdf)
	Statistics Canada, special tabulation for AAFC.
B3.19	Klein, K.K. et al. 1994, "Returns to Beef Research in Canada", Agricultural Systems, 46(4),443-459; Klein, K.K. et al. 1996, "Economic Returns to Yield Increasing Research on Wheat in Western Canada", CJAE, 44, 207-218; Oxley, J. et al. 1996, "The Economic Benefits of Public Potato Research in Canada", AAFC; Thomas, G. et al. 2000, "An Economic Analysis of the Returns to Canadian Swine Research - 1994-1997, Working Paper WP00/01 Department of Agricultural Economics and Business, University of Guelph, January.
B3.20	Agricultural Policies in OECD Countries: Monitoring and Evaluation 2007.
B3.21	OECD, DSTI, STAN Indicators, 2004.
B3.22-B3.24	AAFC, The Nature and Extent of Innovation in the Canadian Food Processing Industry.
B3.25 & B3.26	Statistics Canada, CANSIM Table 031-0002 - Flows and stocks of fixed non-residential capital, by North American Industry Classification System (NAICS), annual.
B3.27-B3.29	Statistics Canada, Balance of International Payments, special tabulation for AAFC.
B3.30	McCain Foods Limited. (http://www.mccain.com/mc_home.htm)

Section C Components of the Agriculture and Agri-Food System

Section C1: Consumers

C1.1 & C1.2	Statistics Canada.
	- CANSIM Table 380-0024 - Personal expenditure on goods and services, annual.
	- Special tabulations from National Accounts.

Data Sources and References (cont'd)

Chart	Source
C1.3	OECD, Annual National Accounts Volume II - Detailed Tables - Main Aggregates Vol. 2005 release 01, Table 11. FINAL CONSUMPTION EXPENDITURE OF HOUSEHOLDS. (http://lysander.sourceoecd.org/vl=901848/cl=11/nw=1/rpsv/home.htm)
C1.4	Statistics Canada, CANSIM Table 326-0021- Consumer Price Index (CPI), 2005 basket, annual.
C1.5	Consumer Perceptions of Food Safety and Quality Wave 2 Tracking 2006, AAFC.
C1.6	Consumer Perceptions of Food Safety and Quality 2004, AAFC. Growing Canada Benchmark Study 2005, AAFC. Consumer Perceptions of Food Safety and Quality Wave 2 Tracking 2006, AAFC. AAFC Omnibus Survey 2007.
C1.7-C1.8	Organic Agricultural Centre of Canada (OACC), "Retail Sales of Certified Organic Food Products, in Canada, in 2006" .
C1.9	Organic Agriculture Centre of Canada (OACC).
C1.10	Domestic Branding Survey, AAFC, 2007.
C1.11	Euromonitor 2007.
Section C2: Food Distribution (Retail/Wholesale and Foodservice)	
C2.1 & C2.2	Statistics Canada. -CANSIM Table 380-0024 - Personal expenditure on goods and services, annual. -Special tabulations from National Accounts.
C2.3	Canadian Grocer, Statistics Canada and AAFC calculations.
C2.4	AAFC calculations based on Dobson Consulting, (1999) and USDA Sources.
C2.5	Statistics Canada. -CANSIM Table 187-0001 - Quarterly balance sheet and income statement, by North American Industry Classification System (NAICS). -CANSIM Table 187-0002 - Quarterly statement of changes in financial position, by North American Industry Classification System (NAICS), selected financial ratios and selected seasonally adjusted components. -Special tabulations from Quarterly Survey of Financial Statistics for Enterprises.
C2.6	Statistics Canada, Quarterly Retail Commodity Survey, special tabulation.
C2.7	A.C. Nielsen.
C2.8	Canadian Restaurant and Foodservices Association. (Sourced from Eating Patterns in Canada Report 2005, NPD Group Canada Inc.).
C2.9	Statistics Canada, CANSIM Table 203-0002 - Household spending on food, by province and territory, annual.

Data Sources and References (cont'd)

Chart	Source
C2.10	Canadian Restaurant and Foodservices Association, Quarterly InfoStats Q4 2005, Chart 4.2.1.
	Statistics Canada, CANSIM Table 355-0001 - Restaurant, caterer and tavern statistics, computed annual total.
C2.11	Canadian Restaurant and Foodservices Association, 2007 Foodservice Sales Forecast and AAFC calculations. (http://www.crfa.ca/research/ - sales%20(%20March%203,%202006))
C2.12	Canadian Restaurant and Foodservices Association. (http://www.crfa.ca/research/2005/top_50_chains_capture_over_half_market_share.asp)
C2.13	Canadian Restaurant and Foodservices Association, Quarterly InfoStats Q4 2005, Chart 6.2.1.
Section C3: Food, Beverage and Tobacco (FBT) Processing	
C3.1	Statistics Canada, Input/Output Model, 2003 and AAFC calculations.
C3.2	Statistics Canada, CANSIM Table 379-0017 - Gross Domestic Product (GDP). at basic price by North American Industry Classification System (NAICS), annual.
C3.3	Statistics Canada, CAMSIM Table 281-0024 - Employment (SEPH), unadjusted for seasonal variation, by type of employee for selected industries classified using the North American Industry Classification System (NAICS), annual.
C3.4-C3.6	Statistics Canada, CANSIM Table 304-0014 - Manufacturers' shipments, inventories, orders and inventory to shipment ratios, by North American Industry Classification System (NAICS), Canada, monthly.
C3.7-C3.8	Statistics Canada, special tabulations from Annual Survey of Manufactures and Logging.
C3.9 & C3.10	Statistics Canada.
C3.11	OECD.
C3.12-C3.13	Statistics Canada and AAFC calculations.
	-CANSIM Table 304-0014 - Manufacturers' shipments, inventories, orders and inventory to shipment ratios, by North American Industry Classification System (NAICS), Canada, monthly.
	-Special tabulation for AAFC (Canadian International Merchandise Trade Database).
C3.14-C3.16	Statistics Canada, special tabulations from Quarterly Survey of Financial Statistics for Enterprises.
Section C4: Primary Agriculture	
C4.1	Statistics Canada, Input/Output Model, 2003 and AAFC calculations.
C4.2	Statistics Canada, 2006 Census of Agriculture. (http://www.statcan.ca/english/agcensus2006/index.htm)
C4.3	Statistics Canada.

Data Sources and References (cont'd)

Chart	Source
	-2006 Census of Agriculture. (http://www.statcan.ca/english/agcensus2006/index.htm)
	-Labour Force Survey, special tabulation for AAFC.
C4.4-C4.12	Agriculture and Agri-Food Canada (AAFC).
C4.13-C4.17	Statistics Canada, CANSIM Table 002-0001- Farm cash receipts, annual.
C4.18	Statistics Canada, special tabulation for AAFC (Canadian International Merchandise Trade Database).
C4.19	Statistics Canada and AAFC calculations.
C4.20	Statistics Canada, OECD and AAFC calculations.
C4.21 & C4.22	Statistics Canada and AAFC.
	-CANSIM Table 002-0009 - Income of farm operators from farming operations, annual.
	-CANSIM Table 002-0023 - Farm business cash flow account, percentage changes and ratios, annual.
C4.23 & C4.24	Statistics Canada, CANSIM Table 002-0004 - Agriculture value-added account, annual.
C4.25	Statistics Canada, 2006 Census of Agriculture and AAFC estimations.
C4.26, C4.33, C4.37, C4.39, C4.42, & C4.45 - C4.47	Statistics Canada and AAFC, 2006 Farm Financial Survey.
C4.27	AAFC, 2004 National Renewal Survey.
C4.28 - C4.32, C4.34 - C4.35, C4.48 - C4.50, & C4.52, C4.53	Statistics Canada, Whole Farm Database.
C4.36 & C4.38	NISA/CAIS Database and AAFC calculations.
C4.40, C4.41, C4.43, & C4.44	Statistics Canada and AAFC, Farm Financial Survey, various years.
C4.51	Canadian Agriculture Dynamic Micro Simulation Model (CADMS) and AAFC calculations.
C4.54 - C4.56	Statistics Canada, Longitudinal Administrative Databank (LAD).
C4.57	Statistics Canada, Whole Farm Database and Small Area Administration Data.
Section C5: Agricultural Input and Service Suppliers	
C5.1	Agriculture and Agri-Food Canada (AAFC).
C5.2	Statistics Canada.
	-CANSIM Table 002-0022 - Farm product price index (FPPI), annual.
	-CANSIM Table 328-0001 - Farm input price index, quarterly *terminated* .
	-CANSIM Table 328-0014 - Farm input price index, annual.
C5.3 & C5.4	Statistics Canada, CANSIM Table 002-0005 - Farm operating expenses and depreciation charges, annual.
C5.5	Natural Resources Canada and Ridgetown College, University of Guelph.
C5.6	Statistics Canada and AAFC calculations.

Data Sources and References (cont'd)

Chart	Source
	-CANSIM Table 002-0005 - Farm operating expenses and depreciation charges, annual.
	-CANSIM Table 328-0001 - Farm input price index, quarterly.
	-CANSIM Table 328-0014 - Farm input price index, annual.
C5.7	Co-operatives Secretariat, AAFC and Statistics Canada.
C5.8	Co-operatives Secretariat, AAFC.

Section D Government and the Agriculture and Agri-Food Sector

Section D1: Government Expenditures in Canada

D1.1 - D1.6 & D1.10	Agriculture and Agri-Food Canada (AAFC).
D1.7	Agricultural Policies in OECD Countries: Monitoring and Evaluation 2007.
D1.8	Statistics Canada, CANSIM Table 031-0002 - Flows and stocks of fixed non-residental capital, by North American Industry Classification System (NAICS), annual.
D1.9	Agriculture and Agri-Food Canada (AAFC) calculations.
D1.11	Cahill, Sean A. (2007). "Corporate Income Tax Rate Database: Canada and the Provinces, 1960-2005".

Section D2: Producer Support Estimates (PSE) and Agricultural Policies in Canada and Other Countries

D2.1 - D2.4	Agricultural Policies in OECD Countries: Monitoring and Evaluation 2007.